

69°, 291° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180°Zn=7
L.H.A. less than 180°Zn=360°-Z

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.								
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z									
0	20	15.1	+16.4	95.7	20	09.0	+17.5	96.0	20	02.5	+18.5	96.4	19	55.6	+19.6	96.8	19	48.4	+20.6	97.1	19	40.8	+21.6	97.5	19	32.8	+22.6	97.8	19	24.4	+23.7	98.2	0
1	20	31.5	+16.0	94.6	20	26.5	+17.0	95.0	20	21.0	+18.2	95.4	20	15.2	+19.2	95.8	20	09.0	+20.2	96.1	20	02.4	+21.3	96.5	19	55.4	+22.4	96.8	19	48.1	+23.3	97.2	1
2	20	47.5	+15.7	93.6	20	43.5	+16.8	94.0	20	39.2	+17.8	94.4	20	34.4	+18.8	94.7	20	29.2	+19.9	95.1	20	23.7	+20.9	95.5	20	17.8	+21.9	95.9	20	11.4	+23.1	96.2	2
3	21	03.2	+15.2	92.6	21	00.3	+16.3	93.0	20	57.0	+17.4	93.4	20	53.2	+18.5	93.7	20	49.1	+19.6	94.1	20	44.6	+20.7	94.5	20	39.7	+21.7	94.9	20	34.5	+22.7	95.2	3
4	21	18.4	+14.9	91.5	21	16.6	+16.0	91.9	21	14.4	+17.0	92.3	21	11.7	+18.2	92.7	21	08.7	+19.2	93.1	21	05.3	+20.2	93.5	21	01.4	+21.3	93.9	20	57.2	+22.3	94.3	4
5	21	33.3	+14.5	90.5	21	32.6	+15.6	90.9	21	31.4	+16.7	91.3	21	29.9	+17.7	91.7	21	27.9	+18.8	92.1	21	25.5	+19.8	92.5	21	22.7	+20.9	92.9	21	19.5	+22.0	93.3	5
6	21	47.8	+14.1	89.5	21	48.2	+15.1	89.9	21	48.1	+16.3	90.3	21	47.6	+17.4	90.7	21	46.7	+18.4	91.1	21	45.4	+19.5	91.5	21	43.6	+20.6	91.9	21	41.5	+21.6	92.3	6
7	22	01.9	+13.7	88.4	22	03.3	+14.8	88.8	22	04.4	+15.9	89.2	22	05.0	+16.9	89.6	22	05.1	+18.1	90.0	22	04.9	+19.1	90.4	22	04.2	+20.2	90.8	22	03.1	+21.3	91.3	7
8	22	15.6	+13.3	87.4	22	18.1	+14.4	87.8	22	20.3	+15.4	88.2	22	21.9	+16.6	88.6	22	23.2	+17.7	89.0	22	24.0	+18.8	89.4	22	24.4	+19.8	89.8	22	24.4	+20.9	90.2	8
9	22	28.9	+12.8	86.3	22	32.5	+14.0	86.7	22	35.7	+15.1	87.1	22	38.5	+16.2	87.6	22	40.9	+17.2	88.0	22	42.8	+18.3	88.4	22	44.2	+19.5	88.8	22	45.3	+20.5	89.2	9
10	22	41.8	+12.4	85.3	22	46.5	+13.6	85.7	22	50.8	+14.7	86.1	22	54.7	+15.8	86.5	22	58.1	+16.9	86.9	23	01.1	+18.0	87.4	23	03.7	+19.0	87.8	23	05.8	+20.1	88.2	10
11	22	54.2	+12.1	84.2	23	00.1	+13.1	84.6	23	05.5	+14.2	85.0	23	10.5	+15.3	85.5	23	15.0	+16.4	85.9	23	19.1	+17.5	86.3	23	22.7	+18.6	86.7	23	25.9	+19.7	87.2	11
12	23	06.3	+11.6	83.1	23	13.2	+12.7	83.5	23	19.7	+13.8	84.0	23	25.8	+14.9	84.4	23	31.4	+16.0	84.8	23	36.6	+17.1	85.3	23	41.3	+18.2	85.7	23	45.6	+19.2	86.1	12
13	23	17.9	+11.1	82.1	23	25.9	+12.3	82.5	23	33.5	+13.4	82.9	23	40.7	+14.5	83.4	23	47.4	+15.6	83.8	23	53.7	+16.7	84.2	23	59.5	+17.8	84.7	24	04.8	+18.9	85.1	13
14	23	29.0	+10.8	81.0	23	38.2	+11.8	81.4	23	46.9	+13.0	81.9	23	55.2	+14.1	82.3	24	03.0	+15.2	82.7	24	10.4	+16.2	83.2	24	17.3	+17.3	83.6	24	23.7	+18.4	84.1	14
15	23	39.8	+10.2	79.9	23	50.0	+11.4	80.3	23	59.9	+12.5	80.8	24	09.3	+13.6	81.2	24	18.2	+14.7	81.7	24	26.6	+15.8	82.1	24	34.6	+16.9	82.6	24	42.1	+18.0	83.0	15
16	23	50.0	+9.8	78.8	24	01.4	+11.0	79.3	24	12.4	+12.0	79.7	24	22.9	+13.1	80.2	24	32.9	+14.2	80.6	24	42.4	+15.4	81.1	24	51.5	+16.5	81.5	25	00.1	+17.6	82.0	16
17	23	59.9	+9.4	77.8	24	12.4	+10.5	78.2	24	24.4	+11.6	78.6	24	36.0	+12.7	79.1	24	47.1	+13.8	79.5	24	57.8	+14.9	80.0	25	08.0	+16.0	80.5	25	17.7	+17.1	80.9	17
18	24	09.3	+8.9	76.7	24	22.9	+10.0	77.1	24	36.0	+11.1	77.6	24	48.7	+12.2	78.0	25	09.9	+13.4	78.5	25	12.7	+14.4	78.9	25	24.0	+15.5	79.4	25	34.8	+16.6	79.9	18
19	24	18.2	+8.4	75.6	24	32.9	+9.5	76.0	24	47.1	+10.7	76.5	25	00.9	+11.8	76.9	25	14.3	+12.8	77.4	25	27.1	+14.0	77.9	25	39.5	+15.1	78.3	25	51.4	+16.2	78.8	19
20	24	26.6	+8.0	74.5	24	42.4	+9.1	74.9	24	57.8	+10.2	75.4	25	12.7	+11.3	75.8	25	27.1	+12.4	76.3	25	41.1	+13.5	76.8	25	54.6	+14.6	77.2	26	07.6	+15.7	77.7	20
21	24	34.6	+7.5	73.4	24	51.5	+8.6	73.9	25	08.0	+9.7	74.3	25	24.0	+10.8	74.8	25	39.5	+11.9	75.2	25	54.6	+13.0	75.7	26	09.2	+14.1	76.2	26	23.3	+15.2	76.6	21
22	24	42.1	+7.1	72.3	25	00.1	+8.2	72.8	25	17.7	+9.2	73.2	25	34.8	+10.3	73.7	25	51.4	+11.5	74.1	26	07.6	+12.5	74.6	26	23.3	+13.6	75.1	22				
23	24	49.2	+6.6	71.2	25	08.3	+7.6	71.7	25	26.9	+8.8	72.1	25	45.1	+9.9	72.6	26	02.9	+10.9	73.0	26	20.1	+12.0	73.5	26	36.9	+13.1	74.0	26	53.2	+14.2	74.5	23
24	24	55.8	+6.1	70.1	25	15.9	+7.2	70.6	25	35.7	+8.2	71.0	25	55.0	+9.3	71.5	26	13.8	+10.4	71.9	26	32.1	+11.6	72.4	26	50.0	+12.6	72.9	27	07.4	+13.7	73.4	24
25	25	0.9	+5.6	69.0	25	23.1	+6.7	69.5	25	43.9	+7.8	69.9	26	04.3	+8.8	70.4	26	24.2	+9.9	70.8	26	43.7	+11.0	71.3	27	02.6	+12.1	71.8	27	21.1	+13.2	72.3	25
26	25	0.7	+5.1	67.9	25	29.8	+6.2	68.4	25	51.7	+7.2	68.8	26	13.1	+8.4	69.3	26	34.1	+9.4	69.7	26	54.7	+10.5	70.2	27	14.7	+11.6	70.7	27	34.3	+12.7	71.2	26
27	25	12.6	+4.6	66.8	25	36.0	+5.6	67.3	25	58.9	+6.8	67.7	26	21.5	+7.8	68.2	26	43.5	+8.9	68.6	27	05.2	+9.9	69.1	27	26.3	+11.1	69.6	27	47.0	+12.1	70.1	27
28	25	17.2	+4.1	65.7	25	41.6	+5.2	66.2	26	05.7	+6.2	66.6	26	29.3	+7.3	67.1	26	52.4	+8.4	67.5	27	15.1	+9.5	68.0	27	37.4	+10.5	68.5	27	59.1	+11.6	69.0	28
29	25	21.3	+3.7	64.6	25	46.8	+4.7	65.1	26	11.9	+5.8	65.5	26	36.6	+6.8	66.0	27	00.8	+7.9	66.4	27	24.6	+8.8	66.9	27	47.9	+10.0	67.4	28	10.7	+11.1	67.9	29
30	25	25.0	+3.1	63.5	25	51.5	+4.2	64.0	26	17.7	+5.2	64.4	26	43.4	+6.2	64.8	27	08.7	+7.3	65.3	27	33.5	+8.4	65.8	27	57.9	+9.4	66.3	28	21.8	+10.5	66.8	30
31	25	28.1	+2.7	62.4	25	55.7	+3.7	62.8	26	22.9	+4.9	63.3	26	49.6	+5.8	63.7	27	16.0	+6.8	64.2	27	41.9	+7.8	64.7	28	07.3	+8.9	65.1	28	32.3	+10.0	65.6	31
32	25	30.8	+2.1	61.3	25	59.4	+3.1	61.7	26	27.6	+4.2	62.2	26	55.4	+5.2	62.6	27	22.8	+6.2	63.1	27	49.7	+7.3	63.5	28	16.2	+8.4	64.0	28	42.3	+9.4	64.5	32
33	25	32.9	+1.7	60.2	26	02.5	+2.7	60.6	26	31.8	+3.6	61.1	27	00.6	+4.7	61.5	27	29.0	+5.7	62.0	27	57.0	+6.8	62.4	28	51.7	+8.8	63.4	33				

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 69°, 291°

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.								
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z									
0	20	15.1	-16.7	95.7	20	09.0	-17.8	96.0	20	02.5	-18.8	96.4	19	55.6	-19.8	96.8	19	48.4	-20.9	97.1	19	40.8	-22.0	97.5	19	32.8	-23.0	97.8	19	24.4	-24.0	98.2	0
1	19	58.4	-17.1	96.7	19	51.2	-18.1	97.1	19	43.7	-19.2	97.4	19	35.8	-20.3	97.8	19	27.5	-21.3	98.1	19	18.8	-22.3	98.5	19	09.8	-23.3	98.8	19	00.4	-24.3	99.2	1
2	19	41.3	-17.4	97.7	19	33.1	-18.5	98.1	19	24.5	-19.5	98.4	19	15.5	-20.5	98.8	19	06.2	-21.6	99.1	18	56.5	-22.5	99.4	18	46.5	-23.6	99.8	18	36.1	-24.5	100.1	2
3	19	23.9	-17.7	98.7	19	14.6	-18.8	99.1	19	05.0	-19.9	99.4	18	55.0	-20.9	99.8	18	44.6	-21.8	100.1	18	34.0	-22.9	100.4	18	22.9	-23.9	100.8	18	11.6	-24.9	101.1	3
4	19	06.2	-18.1	99.7	18	55.8	-19.1	100.1	18	45.1	-20.1	100.4	18	34.1	-21.1	100.8	18	22.8	-22.2	101.1	18	11.1	-23.2	101.4	17	59.0	-24.1	101.7	17	46.7	-25.2	102.0	4
5	18	48.1	-18.5	100.8	18	36.7	-19.4	101.1	18	25.0	-20.5	101.4	18	13.0	-21.5	101.7	18	00.6	-22.5	102.1	17	47.9	-23.5	102.4	17	34.9	-24.5	102.7	17	21.5	-25.4	103.0	5
6	18	29.6	-18.7	101.8	18	17.3	-19.8	102.1	18	04.5	-20.7	102.4	17	51.5	-21.8	102.7	17	38.1	-22.7	103.0	17	24.4	-23.7	103.3	17	10.4	-24.7	103.6	16	56.1	-25.6	103.9	6
7	18	10.9	-19.0	102.8	17	57.5	-20.1	103.1	17	43.8	-21.1	103.4	17	29.7	-22.0	103.7	17	15.4	-23.1	104.0	17	00.7	-24.0	104.3	16	45.7	-25.0	104.6	16	30.5	-26.0	104.9	7
8	17	51.9	-19.4	103.8	17	37.4	-20.3	104.1	17	22.7	-21.3	104.4	17	07.7	-22.4	104.7	16	52.3	-23.3	105.0	16	36.7	-24.3	105.3	16	20.7	-25.2	105.5	16	04.5	-26.1	105.8	8
9	17	32.5	-19.6	104.7	17	17.1	-20.6	105.1	17	01.4	-21.7	105.3	16	45.3	-22.6	105.6	16	29.0	-23.5	105.9	16	12.4	-24.5	106.2	15	55.5	-25.4	106.5	15	38.4	-26.4	106.8	9
10	17	12.9	-19.9	105.7	16	56.5	-21.0	106.0	16	39.7	-21.8	106.3	16	22.7	-22.8	106.6	16	05.5	-23.9	106.9	15	47.9	-24.8	107.2	15	30.1	-25.8	107.4	15	12.0	-26.7	107.7	10
11	16	53.0	-20.3	106.7	16	35.5	-21.1	107.0	16	17.9	-22.2	107.3	15	59.9	-23.1	107.6	15	41.6	-24.0	107.8	15	23.1	-25.0	108.1	15	04.3	-25.9	108.4	14	45.3	-26.8	108.6	11
12	16	32.7	-20.4	107.7	16	14.4	-21.5	108.0	15	55.7	-22.4	108.3	15	36.8	-23.4	108.5	15	17.6	-24.3	108.8	14	58.1	-25.2	109.0	14	38.4	-26.2	109.3	14	18.5	-27.1	109.5	12
13	16	12.3	-20.8	108.7	15	52.9	-21.7	109.0	15	33.3	-22.7	109.2	15	13.4	-23.6	109.5	14	53.3	-24.6	109.7	14	32.9	-25.5	110.0	14	12.2	-26.3	110.2	13	51.4	-27.3	110.5	13
14	15	51.5	-21.0	109.7	15	31.2	-22.0	109.9	15	10.6	-22.9	110.2	14	49.8	-23.9	110.4	14	28.7	-24.8	110.7	14	07.4	-25.7	110.9	13	45.9	-26.6	111.2	13	24.1	-27.5	111.4	14
15	15	30.5	-21.3	110.6	15	09.2	-22.2	110.9	14	47.7	-23.2	111.1	14	25.9	-24.0	111.4	14	03.9	-24.9	111.6	13	41.7	-25.9	111.9	13	19.3	-26.8	112.1	12	56.6	-27.6	112.3	15
16	15	09.2	-21.5	111.6	14	47.0	-22.5	111.9	14	24.5	-23.3	112.1	14	01.9	-24.3	112.3	13	39.0	-25.2	112.6	13	15.8	-26.1	112.8	12	52.5	-27.0	113.0	12	29.0	-27.9	113.2	16
17	14	47.7	-21.8	112.6	14	24.5	-22.6	112.8	14	01.2	-23.6	113.0	13	37.6	-24.5	113.3	13	13.8	-25.4	113.5	12	49.7	-26.2	113.7	12	25.5	-27.1	113.9	12	01.1	-28.0	114.1	17
18	14	25.9	-22.0	113.5	14	01.9	-22.9	113.8	13	37.6	-23.8	114.0	13	13.1	-24.7	114.2	12	48.4	-25.6	114.4	11	58.4	-27.4	114.8	11	33.1	-28.2	115.0	18				
19	14	03.9	-22.2	114.5	13	39.0	-23.2	114.7	13	13.8	-24.1	114.9	12	48.4	-24.9	115.1	12	22.8	-25.8	115.3	11	57.0	-26.0	115.5	11	31.0	-27.5	115.7	11	04.9	-28.3	115.9	19
20	13	41.7	-22.4	115.5	13	15.8	-23.3	115.7	12	49.7	-24.2	115.9	12	23.5	-25.1	116.1	11	57.0	-26.0	116.3	11	30.4	-26.9	116.5	11	03.5	-27.6	116.6	10	36.6	-28.5	116.8	20
21	13	19.3	-22.7	116.4	12	52.5	-23.5	116.6	12	25.5	-24.4	116.8	11	58.4	-25.3	117.0	11	31.0	-26.1	117.2	11	03.5	-26.9	117.4	10	35.9	-27.6	117.5	21				
22	12	56.6	-22.8	117.4	12	29.0	-23.8	117.6	12	01.1	-24.6	117.7	11	33.1	-25.5	117.9	11	04.9	-26.3	118.1	10	36.6	-27.2	118.3	10	08.1	-28.0	118.4	22				
23	12	33.8	-23.1	118.3	12	05.2	-23.9	118.5	11	36.5	-24.8	118.7	11	07.6	-25.6	118.9	10	38.6	-26.4	119.0	10	09.4	-27.3	119.2	9	40.1	-28.1	119.3	9	10.6	-28.9	119.5	23
24	12	10.7	-23.2	119.2	11	41.3	-24.1	119.4	11	17.7	-24.9	119.6	10	42.0	-25.6	119.8	10	12.2	-26.7	119.9	9	42.1	-27.4	120.1	9	12.0	-28.2	120.2	8	41.7	-29.0	120.4	24
25	11	47.5	-23.5	120.2	11	17.2	-24.3	120.4	10	46.8	-25.1	120.5	10	16.2	-25.9	120.7	9	45.5	-26.7	120.8	9	14.7	-27.5	121.0	8	43.8	-28.4	121.1	8	12.7	-29.2	121.3	25
26	11	24.0	-23.6	121.1	10	21.7	-25.3	121.5	9	50.3	-26.1	121.6	9	18.8	-26.9	121.8	8	47.2	-27.7	121.9	8	15.4	-28.5	122.0	7	43.5	-29.2	122.1	26				
27	11	00.4	-23.8	122.1	10	28.5	-24.6	122.2	9	56.4	-25.4	122.4	9	24.2	-26.2	122.5	8	51.9	-27.0	122.7	8	19.5	-27.8	122.8	7	14.3	-29.4	123.0	27				
28	10	36.6	-23.9	123.0	10	03.9	-24.8	123.2	9	31.0	-25.6	123.3	8	58.0	-26.4	123.4	8	24.9	-27.2	123.6	7	51.7	-28.0	123.8	6	44.9	-29.4	123.9	28				
29	10	12.7	-24.1	123.9	9	39.1	-24.9	124.1	9	05.4	-25.7	124.2	8	31.6	-26.4	124.3	7	57.7	-27.2	124.5	7	23.7	-28.0	124.6	6	49.6	-28.8	124.7	29				
30	9	48.6	-24.3	124.9	8	14.2	-25.0	125.0	8	39.7	-25.8	125.1	8	05.2	-26.7	125.3	7	30.5	-27.4	125.4	6	55.7	-28.1	125.5	6	45.9	-29.6	125.6	30				
31	9	24.3	-24.4	125.8	8	49.2	-25.2	125.9	8	13.9	-26.0	126.0	7	38.5	-26.7	126.2	7	03.1	-27.5	126.3	6	27.6	-28.2	126.4	5	16.3	-29.7	126.5	31				
32	8	59.9	-24.5	126.7	8	24.0	-25.3	126.8	7	47.9	-26.0	127.0	7	11.8	-26.8	127.1	6	35.6	-27.5	127.2	5	59.4	-28.4	127.2	4	46.6	-29.8	127.4	32				
33	8	35.4	-24.7	127.6	7	58.7	-25.5	127.8	7	21.9	-26.2	127.9	6	45.0	-26.9	128.0	5	31.0	-27.7	128.1	4	54.0	-29.1	128.2	3	16.8	-29.8	128.3	33				
34	8	10.7	-25.7	128.6	7	24.7	-26.3	128.8	6	29.4	-26.4	128.9</td																					

70°, 290° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180°Zn=7
L.H.A. less than 180°Zn=360°-Z

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z										
0	19 17.5 +16.2	95.4	0	19 11.7 +17.3	95.7	0	19 05.5 +18.4	96.1	0	18 59.0 +19.4	96.4	0	18 52.1 +20.5	96.8	0	18 44.8 +21.5	97.1	0	18 37.2 +22.6	97.4	0	18 29.3 +23.6	97.8	0	
1	19 33.7 +16.0	94.4	0	19 29.0 +17.0	94.7	0	19 23.9 +18.0	95.1	0	19 18.4 +19.1	95.4	0	19 12.6 +20.1	95.8	0	19 06.3 +21.2	96.1	0	18 59.8 +22.2	96.5	0	18 52.9 +23.2	96.8	1	
2	19 49.7 +15.6	93.3	0	19 46.0 +16.7	93.7	0	19 41.9 +17.8	94.1	0	19 37.5 +18.8	94.4	0	19 32.7 +19.8	94.8	0	19 27.5 +20.9	95.1	0	19 22.0 +21.9	95.5	0	19 16.1 +22.9	95.8	2	
3	20 05.3 +15.2	92.3	0	20 02.7 +16.3	92.7	0	19 59.7 +17.3	93.0	0	19 56.3 +18.4	93.4	0	19 52.5 +19.5	93.8	0	19 48.4 +20.6	94.1	0	19 43.9 +21.6	94.5	0	19 39.0 +22.7	94.8	3	
4	20 20.5 +14.9	91.3	0	20 19.0 +15.9	91.6	0	20 17.0 +17.1	92.0	0	20 14.7 +18.1	92.4	0	20 12.0 +19.2	92.8	0	20 09.0 +20.2	93.1	0	20 05.5 +21.3	93.5	0	20 01.7 +22.2	93.9	4	
5	20 35.4 +14.5	90.2	0	20 34.9 +15.6	90.6	0	20 34.1 +16.6	91.0	0	20 32.8 +17.7	91.4	0	20 31.2 +18.8	91.7	0	20 29.2 +19.8	92.1	0	20 26.8 +20.9	92.5	0	20 23.9 +22.0	92.9	5	
6	20 49.9 +14.1	89.2	0	20 50.5 +15.2	89.6	0	20 50.7 +16.3	90.0	0	20 50.5 +17.4	90.3	0	20 50.0 +18.4	90.7	0	20 49.0 +19.5	91.1	0	20 47.7 +20.5	91.5	0	20 45.9 +21.6	91.9	6	
7	21 04.0 +13.7	88.2	0	21 05.7 +14.8	88.6	0	21 07.0 +15.9	88.9	0	21 07.9 +17.0	89.3	0	21 08.4 +18.1	89.7	0	21 08.5 +19.2	90.1	0	21 08.2 +20.2	90.5	0	21 07.5 +21.3	90.9	7	
8	21 17.7 +13.4	87.1	0	21 20.5 +14.5	87.5	0	21 22.9 +15.5	87.9	0	21 24.9 +16.6	88.3	0	21 26.5 +17.7	88.7	0	21 27.7 +18.7	89.1	0	21 28.4 +19.8	89.5	0	21 28.8 +20.8	89.9	8	
9	21 31.1 +12.8	86.1	0	21 35.0 +14.0	86.5	0	21 38.4 +15.2	86.9	0	21 41.5 +16.2	87.3	0	21 44.2 +17.3	87.7	0	21 46.4 +18.4	88.1	0	21 48.2 +19.5	88.5	0	21 49.6 +20.6	88.9	9	
10	21 44.0 +12.6	85.0	0	21 49.0 +13.7	85.4	0	21 53.6 +14.7	85.8	0	21 57.7 +15.9	86.2	0	22 01.5 +16.9	86.6	0	22 04.8 +18.0	87.0	0	22 07.7 +19.1	87.4	0	22 10.2 +20.1	87.8	10	
11	21 56.6 +12.1	84.0	0	22 02.7 +13.2	84.4	0	22 08.3 +14.4	84.8	0	22 13.6 +15.4	85.2	0	22 18.4 +16.5	85.6	0	22 22.8 +17.6	86.0	0	22 26.8 +18.7	86.4	0	22 30.3 +19.8	86.8	11	
12	22 08.7 +11.8	82.9	0	22 15.9 +12.9	83.3	0	22 22.7 +13.9	83.7	0	22 29.0 +15.1	84.1	0	22 34.9 +16.2	84.6	0	22 40.4 +17.2	85.0	0	22 45.5 +18.2	85.4	0	22 50.1 +19.3	85.8	12	
13	22 20.5 +11.3	81.9	0	22 28.8 +12.4	82.3	0	22 36.6 +13.5	82.7	0	22 44.1 +14.6	83.1	0	22 51.1 +15.7	83.5	0	22 57.6 +16.8	83.9	0	23 03.7 +17.9	84.4	0	23 09.4 +19.0	84.8	13	
14	22 31.8 +10.9	80.8	0	22 41.2 +12.0	81.2	0	22 50.1 +13.2	81.6	0	22 58.7 +14.2	82.0	0	23 06.8 +15.3	82.5	0	23 14.4 +16.4	82.9	0	23 21.6 +17.5	83.3	0	23 28.4 +18.5	83.7	14	
15	22 42.7 +10.5	79.7	0	22 53.2 +11.6	80.1	0	23 03.3 +12.6	80.6	0	23 12.9 +13.8	81.0	0	23 22.1 +14.8	81.4	0	23 30.8 +16.0	81.8	0	23 39.1 +17.1	82.3	0	23 46.9 +18.2	82.7	15	
16	22 53.2 +10.1	78.7	0	23 04.8 +11.1	79.1	0	23 15.9 +12.3	79.5	0	23 26.7 +13.3	79.9	0	23 36.9 +14.5	80.4	0	23 46.8 +15.5	80.8	0	23 56.2 +16.6	81.2	0	24 05.1 +17.7	81.7	16	
17	23 03.3 +9.6	77.6	0	23 15.9 +10.8	78.0	0	23 28.2 +11.8	78.4	0	23 40.0 +12.9	78.9	0	23 51.4 +14.0	79.3	0	24 02.3 +15.1	79.7	0	24 12.8 +16.2	80.2	0	24 22.8 +17.3	80.6	17	
18	23 12.9 +9.2	76.5	0	23 26.7 +10.2	76.9	0	23 40.0 +11.4	77.4	0	23 52.9 +12.5	77.8	0	24 05.4 +13.5	78.2	0	24 17.4 +14.6	78.7	0	24 29.0 +15.7	79.1	0	24 40.1 +16.8	79.6	18	
19	23 22.1 +8.7	75.4	0	23 36.9 +9.9	75.9	0	23 51.4 +10.9	76.3	0	24 05.4 +12.0	76.7	0	24 18.9 +13.1	77.2	0	24 32.0 +14.2	77.6	0	24 44.7 +15.3	78.0	0	24 56.9 +16.4	78.5	19	
20	23 30.8 +8.3	74.4	0	23 46.8 +9.4	74.8	0	24 02.3 +10.5	75.2	0	24 17.4 +11.6	75.6	0	24 32.0 +12.7	76.1	0	24 46.2 +13.8	76.5	0	25 00.0 +14.8	77.0	0	25 13.3 +15.9	77.4	20	
21	23 39.1 +7.8	73.3	0	23 56.2 +8.9	73.7	0	24 12.8 +10.0	74.1	0	24 29.0 +11.1	74.6	0	25 04.4 +12.2	75.0	0	25 00.0 +13.3	75.5	0	25 14.8 +14.4	75.9	0	25 29.2 +15.5	76.4	21	
22	23 46.9 +7.4	72.2	0	24 05.1 +8.5	72.6	0	24 22.8 +9.5	73.1	0	24 40.1 +10.6	73.5	0	25 56.9 +11.7	73.9	0	25 13.3 +12.8	74.4	0	25 29.2 +13.9	74.8	0	25 44.7 +14.9	75.3	22	
23	23 54.3 +7.0	71.1	0	24 13.6 +8.0	71.5	0	24 32.3 +9.1	72.0	0	24 50.7 +10.2	72.4	0	25 08.6 +11.3	72.8	0	25 26.1 +12.3	73.3	0	25 43.1 +13.4	73.8	0	25 59.6 +14.5	74.2	23	
24	24 01.3 +6.4	70.0	0	24 21.6 +7.5	70.4	0	24 41.4 +8.6	70.9	0	25 00.9 +9.7	71.3	0	25 19.9 +10.7	71.8	0	25 38.4 +11.9	72.2	0	25 56.5 +12.9	72.7	0	26 14.1 +14.1	73.1	24	
25	24 07.7 +6.1	68.9	0	24 29.1 +7.1	69.4	0	24 50.0 +8.2	69.8	0	25 10.6 +9.2	70.2	0	25 30.6 +10.3	70.7	0	25 50.3 +11.3	71.1	0	26 09.4 +12.5	71.6	0	26 28.2 +13.5	72.1	25	
26	24 13.8 +5.5	67.8	0	24 36.2 +6.6	68.3	0	24 58.2 +7.7	68.7	0	25 19.8 +8.7	69.1	0	25 40.9 +9.8	69.6	0	26 01.6 +10.9	70.0	0	26 21.9 +11.9	70.5	0	26 41.7 +13.0	71.0	26	
27	24 19.3 +5.1	66.8	0	24 42.8 +6.1	67.2	0	25 05.9 +7.1	67.6	0	25 28.5 +8.2	68.0	0	25 50.7 +9.3	68.5	0	26 12.5 +10.4	68.9	0	26 33.8 +11.5	69.4	0	26 54.7 +12.5	69.9	27	
28	24 24.4 +4.6	65.7	0	24 48.9 +5.7	66.1	0	25 13.0 +6.7	66.5	0	25 36.7 +7.8	66.9	0	26 00.0 +8.8	67.4	0	26 22.9 +9.8	67.8	0	26 45.3 +10.9	68.3	0	27 07.2 +12.0	68.8	28	
29	24 29.0 +4.1	64.6	0	24 54.6 +5.1	65.0	0	25 19.7 +6.2	65.4	0	25 44.5 +7.2	65.8	0	26 08.8 +8.3	66.3	0	26 32.7 +9.4	66.7	0	26 56.2 +10.4	67.2	0	27 19.2 +11.5	67.7	29	
30	24 33.1 +3.7	63.5	0	24 59.7 +4.7	63.9	0	25 25.9 +5.7	64.3	0	25 51.7 +6.8	64.7	0	26 17.1 +7.8	65.2	0	26 42.1 +8.8	65.6	0	27 06.6 +9.9	66.1	0	27 30.7 +11.0	66.6	30	
31	24 36.8 +3.1	62.4	0	25 04.4 +4.2	62.8	0	25 31.6 +5.3	63.2	0	25 58.5 +6.2	63.6	0	26 24.9 +7.3	64.1	0	26 50.9 +8.4	64.5	0	27 16.5 +9.4	65.0	0	27 41.7 +10.4	65.5	31	
32	24 39.9 +2.7	61.3	0	25 08.6 +3.7	61.7	0	25 36.9 +4.7	62.1	0	26 04.7 +5.8	62.5	0	25 32.2 +6.8	63.0	0	26 59.3 +7.8	63.4	0	27 25.9 +8.8	63.9	0	27 52.1 +9.9	64.3	32	
33	24 42.6 +2.2	60.2	0	25 12.3 +3.2	60.6	0	25 41.6 +4.2	61.0	0	26 10.5 +5.2	61.4	0	26 39.0 +6.2	61.9	0	27 07.1 +7.2	62.3	0	27 34.7 +8.3	62.8	0	28 02.0 +9.3	63.2	33	
34	24 44.8 +1.8	59.1	0	25 15.5 +2.7	59.5	0	25 45.8 +3.7	59.9	0	26 15.7 +4.7	60.3	0	26 45.2 +5.7	60.7	0	27 14.3 +6.3	61.2	0	27 43.0 +7.8	61.6	0	28 11.3 +8.8	62.1	34	
35	24 46.6 +1.2	58.0	0	25 18.2 +2.2	58.4	0	25 49.5 +3.2	58.8	0	26 20.4 +4.2	59.2	0	26 50.9 +5.2	59.6	0	27 21.1 +6.2	60.1	0	27 50.8 +7.2	60.5	0	28 20.1 +8.3	61.0	35	
36	24 47.8 +0.8	56.9	0	25 20.4 +1.8	57.3	0	25 52.7 +2.7	57.7	0	26 24.6 +3.7	58.1	0	26 56.1 +4.7	58.5</td											

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 70°, 290°

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.								
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z									
0	19	17.5	-16.7	95.4	19	11.7	-17.7	95.7	19	05.5	-18.7	96.1	18	59.0	-19.8	96.4	18	52.1	-20.8	96.8	18	44.8	-21.8	97.1	18	37.2	-22.8	97.4	18	29.3	-23.8	97.8	0
1	19	00.8	-16.9	96.4	18	54.0	-18.0	96.7	18	46.8	-19.1	97.1	18	39.2	-20.1	97.4	18	31.3	-21.1	97.7	18	23.0	-22.1	98.1	18	14.4	-23.1	98.4	18	05.5	-24.2	98.7	1
2	18	43.9	-17.3	97.4	18	36.0	-18.4	97.7	18	27.7	-19.4	98.1	18	19.1	-20.4	98.4	18	10.2	-21.4	98.7	18	00.9	-22.4	99.1	17	51.3	-23.4	99.4	17	41.3	-24.4	99.7	2
3	18	26.6	-17.6	98.4	18	17.6	-18.6	98.8	18	08.3	-19.6	99.1	17	58.7	-20.7	99.4	17	48.8	-21.7	99.7	17	38.5	-22.7	100.0	17	27.9	-23.7	100.3	17	16.9	-24.7	100.7	3
4	18	09.0	-17.9	99.4	17	59.0	-18.9	99.8	17	48.7	-20.0	100.1	17	38.0	-21.0	100.4	17	27.1	-22.0	100.7	17	15.8	-23.0	101.0	17	04.2	-24.0	101.3	16	52.2	-24.9	101.6	4
5	17	51.1	-18.2	100.4	17	40.1	-19.3	100.7	17	28.7	-20.2	101.1	17	17.0	-21.2	101.4	17	05.1	-22.3	101.7	16	52.8	-23.3	102.0	16	40.2	-24.2	102.3	16	27.3	-25.2	102.6	5
6	17	32.9	-18.5	101.4	17	20.8	-19.5	101.7	17	08.5	-20.6	102.0	16	55.8	-21.6	102.3	16	42.8	-22.5	102.6	16	29.5	-23.5	102.9	16	16.0	-24.5	103.2	16	02.1	-25.5	103.5	6
7	17	14.4	-18.9	102.4	17	01.3	-19.8	102.7	16	47.9	-20.8	103.0	16	34.2	-21.8	103.3	16	20.3	-22.8	103.6	16	06.0	-23.8	103.9	15	51.5	-24.8	104.2	15	36.6	-25.7	104.4	7
8	16	55.5	-19.1	103.4	16	41.5	-20.1	103.7	16	27.1	-21.1	104.0	16	12.4	-22.1	104.3	15	57.5	-23.1	104.6	15	42.2	-24.0	104.8	15	26.7	-24.9	105.1	15	10.9	-25.9	105.4	8
9	16	36.4	-19.3	104.4	16	21.4	-20.4	104.7	16	06.0	-21.4	105.0	15	50.3	-22.3	105.3	15	34.4	-23.3	105.5	15	18.2	-24.2	105.8	15	01.8	-25.3	106.1	14	45.0	-26.1	106.3	9
10	16	17.1	-19.7	105.4	16	01.0	-20.7	105.7	15	44.6	-21.6	106.0	15	28.0	-22.6	106.2	15	11.1	-23.5	106.5	14	54.0	-24.5	106.7	14	36.5	-25.4	107.0	14	18.9	-26.4	107.2	10
11	15	57.4	-19.9	106.4	15	40.3	-20.8	106.7	15	23.0	-21.9	106.9	15	05.4	-22.8	107.2	14	47.6	-23.8	107.4	14	29.5	-24.8	107.7	14	11.1	-25.6	108.2	11				
12	15	37.5	-20.2	107.4	15	19.4	-21.1	107.6	15	01.1	-22.1	107.9	14	42.6	-23.1	108.1	14	23.8	-24.0	108.4	14	04.7	-24.9	108.6	13	45.5	-25.9	108.9	13	26.0	-26.8	109.1	12
13	15	17.3	-20.4	108.3	14	58.3	-21.4	108.6	14	39.0	-22.3	108.8	14	19.5	-23.3	109.1	13	59.8	-24.2	109.3	13	39.8	-25.1	109.6	13	19.6	-26.1	109.8	12	59.2	-27.0	110.0	13
14	14	56.9	-20.7	109.3	14	36.9	-21.6	109.6	14	16.7	-22.6	109.8	13	56.2	-23.5	110.0	13	35.6	-24.5	110.3	13	14.7	-25.4	110.5	12	53.5	-26.2	110.7	12	32.2	-27.1	110.9	14
15	14	36.2	-20.9	110.3	14	15.3	-21.9	110.5	13	54.1	-22.8	110.8	13	32.7	-23.7	111.0	13	11.1	-24.6	111.2	12	49.3	-25.5	111.4	12	27.3	-26.4	111.6	12	05.1	-27.4	111.8	15
16	14	15.3	-21.2	111.3	13	53.4	-22.1	111.5	13	31.3	-23.0	111.7	13	09.0	-23.9	111.9	12	46.5	-24.8	112.1	12	23.8	-25.8	112.4	12	00.9	-26.7	112.6	11	37.7	-27.5	112.7	16
17	13	54.1	-21.4	112.2	13	31.3	-22.3	112.4	13	08.3	-23.2	112.7	12	45.1	-24.2	112.9	12	21.7	-25.1	113.1	11	58.0	-25.9	113.3	11	34.2	-26.8	113.5	11	10.2	-27.6	113.7	17
18	13	32.7	-21.6	113.2	13	09.0	-22.5	113.4	12	45.1	-23.4	113.6	12	20.9	-24.3	113.8	11	56.6	-25.2	114.0	11	32.1	-26.1	114.2	11	07.4	-26.9	114.4	10	42.6	-27.8	114.6	18
19	13	11.1	-21.8	114.1	12	46.5	-22.7	114.3	12	21.7	-23.7	114.6	11	56.6	-24.5	114.9	11	31.4	-25.4	114.9	10	40.5	-26.2	115.1	10	14.8	-28.0	115.5	19				
20	12	49.3	-22.0	115.1	12	23.8	-22.9	115.3	11	58.0	-23.8	115.5	11	32.1	-24.7	115.7	11	06.0	-25.5	115.9	10	39.8	-26.4	116.0	10	13.4	-27.3	116.2	9	46.8	-28.1	116.4	20
21	12	27.3	-22.2	116.0	12	00.9	-23.2	116.2	11	34.2	-24.0	116.4	11	07.4	-24.8	116.6	10	40.5	-25.7	116.8	10	13.4	-26.6	116.9	9	46.1	-27.4	117.1	21				
22	12	05.1	-22.4	117.0	11	37.7	-23.2	117.2	11	10.2	-24.1	117.4	10	42.6	-25.0	117.5	10	14.8	-25.9	117.7	9	59.2	-27.5	118.0	8	50.5	-28.4	118.1	22				
23	11	42.7	-22.6	117.9	11	14.5	-23.5	118.1	10	46.1	-24.3	118.3	10	17.6	-25.2	118.5	9	48.9	-26.0	118.6	9	20.1	-26.8	118.8	8	22.1	-28.5	119.0	23				
24	11	20.1	-22.8	118.9	10	51.0	-23.6	119.1	10	21.8	-24.5	119.2	9	52.4	-25.3	119.4	9	22.9	-26.2	119.5	8	23.5	-27.0	119.8	7	53.6	-28.6	119.9	24				
25	10	57.3	-23.0	119.8	10	27.4	-23.8	120.0	9	57.3	-24.7	120.2	9	27.1	-25.5	120.3	8	56.7	-26.3	120.4	8	26.3	-27.1	120.6	7	25.0	-28.7	120.8	25				
26	10	34.3	-23.1	120.8	10	03.6	-24.0	120.9	9	32.6	-24.7	121.1	9	01.6	-25.6	121.2	8	30.4	-26.4	121.4	7	59.2	-27.2	121.5	7	27.8	-28.0	121.6	6	56.3	-28.8	121.7	26
27	10	11.2	-23.3	121.7	9	39.6	-24.1	121.9	9	07.9	-25.0	122.0	8	36.0	-25.7	122.1	8	04.0	-26.5	122.3	7	32.0	-27.4	122.4	6	59.8	-28.1	122.5	27				
28	9	47.9	-23.4	122.6	9	15.5	-24.3	122.8	8	42.9	-25.0	122.9	8	10.3	-25.9	123.0	7	37.5	-26.6	123.2	7	04.6	-27.4	123.4	5	58.6	-29.0	123.5	28				
29	9	24.5	-23.6	123.6	8	51.2	-24.3	123.7	8	17.9	-25.2	123.8	7	44.4	-26.0	124.0	7	10.9	-26.8	124.1	6	37.2	-27.5	124.2	5	29.6	-29.0	124.3	29				
30	9	00.9	-23.7	124.5	8	26.9	-24.6	124.6	7	52.7	-25.3	124.8	7	18.4	-26.0	124.9	6	44.1	-26.9	125.0	6	09.7	-27.6	125.1	5	35.2	-28.4	125.1	30				
31	8	37.2	-23.9	125.4	8	02.3	-24.6	125.6	7	27.4	-25.4	125.7	6	52.4	-26.2	125.8	6	17.2	-26.9	125.9	5	42.1	-27.7	126.0	4	31.5	-29.2	126.1	31				
32	8	13.3	-23.9	126.4	7	37.7	-24.7	126.5	7	02.0	-25.5	126.6	6	26.2	-26.3	126.7	5	50.3	-27.0	126.8	5	14.4	-28.4	126.9	4	02.3	-29.3	127.0	32				
33	7	49.4	-24.2	127.3	7	13.0	-24.9	127.4	6	36.5	-25.7	127.5	5	59.9	-26.4	127.6	5	23.3	-27.1	127.7	4	46.6	-27.9	127.8	3	33.0	-29.3	127.9	33				
34	7	25.2	-24.2	128.2	7	09.8	-25.7	128.3	6	24.4	-26.3	128.4	6	03.9	-26.9	128.5	5	05.3	-27.5	128.6	4	50.1	-28.2	128.7									

71°, 289° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180°Zn=7
L.H.A. less than 180°Zn=360°-Z

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.
	Hc	d	Z																						
0	18 19.7	+16.2	95.1	18 14.2	+17.3	95.4	18 08.4	+18.3	95.7	18 02.2	+19.4	96.1	17 55.7	+20.4	96.4	17 48.9	+21.4	96.7	17 41.7	+22.4	97.0	17 34.2	+23.4	97.3	0
1	18 35.9	+15.9	94.1	18 31.5	+16.9	94.4	18 26.7	+18.0	94.7	18 21.6	+19.0	95.1	18 16.1	+20.1	95.4	18 10.3	+21.1	95.7	18 04.1	+22.1	96.1	17 57.6	+23.1	96.4	1
2	18 51.8	+15.6	93.1	18 48.4	+16.6	93.4	18 44.7	+17.7	93.7	18 40.6	+18.7	94.1	18 36.2	+19.7	94.4	18 31.4	+20.8	94.7	18 26.2	+21.9	95.1	18 20.7	+22.9	95.4	2
3	19 07.4	+15.1	92.0	19 05.0	+16.3	92.4	19 02.4	+17.3	92.7	19 59.3	+18.4	93.1	18 55.9	+19.5	93.4	18 52.2	+20.5	93.8	18 48.1	+21.5	94.1	18 43.6	+22.5	94.4	3
4	19 22.5	+14.9	91.0	19 21.3	+15.9	91.4	19 19.7	+17.0	91.7	19 17.7	+18.1	92.1	19 15.4	+19.1	92.4	19 12.7	+20.1	92.8	19 09.6	+21.2	93.1	19 06.1	+22.3	93.5	4
5	19 37.4	+14.5	90.0	19 37.2	+15.6	90.3	19 36.7	+16.6	90.7	19 35.8	+17.7	91.1	19 34.5	+18.8	91.4	19 32.8	+19.8	91.8	19 30.8	+20.9	92.1	19 28.4	+21.9	92.5	5
6	19 51.9	+14.1	89.0	19 52.8	+15.2	89.3	19 53.3	+16.3	89.7	19 53.5	+17.4	90.0	19 53.3	+18.4	90.4	19 52.6	+19.5	90.8	19 51.7	+20.5	91.1	19 50.3	+21.6	91.5	6
7	20 06.0	+13.8	87.9	20 08.0	+14.9	88.3	20 09.6	+16.0	88.7	20 10.9	+17.0	89.0	20 11.7	+18.1	89.4	20 12.1	+19.2	89.8	20 12.2	+20.2	90.1	20 11.9	+21.2	90.5	7
8	20 19.8	+13.4	86.9	20 22.9	+14.5	87.3	20 25.6	+15.6	87.6	20 27.9	+16.6	88.0	20 29.8	+17.7	88.4	20 31.3	+18.8	88.7	20 32.4	+19.9	89.1	20 33.1	+20.9	89.5	8
9	20 33.2	+13.1	85.8	20 37.4	+14.1	86.2	20 41.2	+15.2	86.6	20 44.5	+16.3	87.0	20 47.5	+17.4	87.4	20 50.1	+18.4	87.7	20 52.3	+19.4	88.1	20 54.0	+20.6	88.5	9
10	20 46.3	+12.6	84.8	20 51.5	+13.8	85.2	20 56.4	+14.8	85.6	21 00.8	+15.9	85.9	21 04.9	+17.0	86.3	21 08.5	+18.1	86.7	21 11.7	+19.2	87.1	21 14.6	+20.2	87.5	10
11	20 58.9	+12.3	83.8	21 05.3	+13.3	84.1	21 11.2	+14.5	84.5	21 16.7	+15.6	84.9	21 21.9	+16.6	85.3	21 26.6	+17.7	85.7	21 30.9	+18.7	86.1	21 34.8	+19.8	86.5	11
12	21 11.2	+11.9	82.7	21 18.6	+13.0	83.1	21 25.7	+14.0	83.5	21 32.3	+15.1	83.9	21 38.5	+16.2	84.3	21 44.3	+17.3	84.7	21 49.6	+18.4	85.1	21 54.6	+19.5	85.5	12
13	21 23.1	+11.5	81.7	21 31.6	+12.6	82.0	21 39.7	+13.7	82.4	21 47.4	+14.8	82.8	21 54.7	+15.8	83.2	22 01.6	+16.8	83.6	22 08.0	+18.0	84.0	22 14.1	+19.0	84.4	13
14	21 34.6	+11.1	80.6	21 44.2	+12.2	81.0	21 53.4	+13.3	81.4	22 02.2	+14.3	81.8	22 10.5	+15.5	82.2	22 18.5	+16.5	82.6	22 26.0	+17.6	83.0	22 33.1	+18.7	83.4	14
15	21 45.7	+10.7	79.5	21 56.4	+11.8	79.9	22 06.7	+12.8	80.3	22 16.5	+14.0	80.7	22 26.0	+15.0	81.1	22 35.0	+16.1	81.6	22 43.6	+17.2	82.0	22 51.8	+18.3	82.4	15
16	21 56.4	+10.3	78.5	22 08.2	+11.3	78.9	22 19.5	+12.5	79.3	22 30.5	+13.5	79.7	22 41.0	+14.7	80.1	22 51.1	+15.7	80.5	23 00.8	+16.8	80.9	23 10.1	+17.8	81.3	16
17	22 06.7	+9.8	77.4	22 19.5	+11.0	77.8	22 32.0	+12.0	78.2	22 44.0	+13.2	78.6	22 55.7	+14.2	79.0	23 06.8	+15.3	79.5	23 17.6	+16.4	79.9	23 27.9	+17.5	80.3	17
18	22 16.5	+9.5	76.4	22 30.5	+10.5	76.8	22 44.0	+11.7	77.2	22 57.2	+12.7	77.6	23 09.9	+13.7	78.0	23 22.1	+14.9	78.4	23 34.0	+15.9	78.8	23 45.4	+17.0	79.3	18
19	22 26.0	+9.0	75.3	22 41.0	+10.1	75.7	22 55.7	+11.1	76.1	23 09.9	+12.2	76.5	23 23.6	+13.4	76.9	23 37.0	+14.4	77.4	23 49.9	+15.5	77.8	24 02.4	+16.6	78.2	19
20	22 35.0	+8.6	74.2	22 51.1	+9.7	74.6	23 06.8	+10.8	75.0	23 22.1	+11.9	75.4	23 37.0	+12.9	75.9	23 51.4	+14.0	76.3	24 05.4	+15.1	76.7	24 19.0	+16.2	77.2	20
21	22 43.6	+8.2	73.1	23 00.8	+9.3	73.5	23 17.6	+10.3	74.0	23 34.0	+11.4	74.4	23 49.9	+12.5	75.2	24 05.4	+13.6	75.2	24 20.5	+14.7	75.7	24 35.2	+15.7	76.1	21
22	22 51.8	+7.7	72.1	23 10.1	+8.8	72.5	23 27.9	+9.9	72.9	23 45.4	+10.9	73.3	24 02.4	+12.0	73.7	24 19.0	+13.1	74.2	24 35.2	+14.1	74.6	24 50.9	+15.2	75.0	22
23	22 59.5	+7.3	71.0	23 18.9	+8.3	71.4	23 37.8	+9.4	71.8	23 56.3	+10.5	72.2	24 14.4	+11.6	72.7	24 32.1	+12.7	73.1	24 49.3	+13.8	73.5	25 06.1	+14.8	74.0	23
24	23 06.8	+6.9	69.9	23 27.2	+8.0	70.3	23 47.2	+9.0	70.7	24 06.8	+10.1	71.1	24 26.0	+11.1	71.6	24 44.8	+12.2	72.0	25 03.1	+13.2	72.5	25 20.9	+14.4	72.9	24
25	23 13.7	+6.4	68.8	23 35.2	+7.4	69.2	23 56.2	+8.6	69.6	24 16.9	+9.6	70.1	24 37.1	+10.7	70.5	24 57.0	+11.7	70.9	25 16.3	+12.8	71.4	25 35.3	+13.8	71.8	25
26	23 20.1	+6.0	67.7	23 42.6	+7.0	68.2	24 04.8	+8.0	68.6	24 26.5	+9.1	69.0	24 47.8	+10.2	69.4	25 08.7	+11.2	69.8	25 29.1	+12.3	70.3	25 49.1	+13.4	70.7	26
27	23 26.1	+5.5	66.7	23 49.6	+6.6	67.1	24 12.8	+7.6	67.5	24 35.6	+8.7	67.9	24 58.0	+9.7	68.3	25 19.9	+10.8	68.8	25 41.4	+11.9	69.2	26 02.5	+12.9	69.7	27
28	23 31.6	+5.1	65.6	23 56.2	+6.1	66.0	24 20.4	+7.2	66.4	24 44.3	+8.1	66.8	25 07.7	+9.2	67.2	25 30.7	+10.3	67.7	25 53.3	+11.3	68.1	26 15.4	+12.4	68.6	28
29	23 36.7	+4.6	64.5	24 02.3	+5.6	64.9	24 27.6	+6.6	65.3	24 52.4	+7.8	65.7	25 16.9	+8.8	66.1	25 41.0	+9.6	66.6	26 04.6	+10.9	67.0	26 27.8	+11.9	67.5	29
30	23 41.3	+4.1	63.4	24 07.9	+5.2	63.8	24 34.2	+6.2	64.2	25 00.2	+7.2	64.6	25 25.7	+8.2	65.0	25 50.8	+9.3	65.5	26 15.5	+10.3	65.9	26 39.7	+11.4	66.4	30
31	23 45.4	+3.7	62.3	24 13.1	+4.7	62.7	24 40.4	+5.8	63.1	25 07.4	+6.7	63.5	25 33.9	+7.8	64.0	26 00.1	+8.8	64.4	26 25.8	+9.8	64.8	26 51.1	+10.9	65.3	31
32	23 49.1	+3.3	61.2	24 17.8	+4.3	61.6	24 46.2	+5.2	62.0	25 14.1	+6.3	62.4	25 41.7	+7.3	62.9	26 08.9	+8.3	63.3	26 35.6	+9.4	63.7	27 02.0	+10.3	64.2	32
33	23 52.4	+2.7	60.1	24 22.1	+3.7	60.5	24 51.4	+4.8	60.9	25 20.4	+5.7	61.3	25 49.0	+6.7	61.8	26 17.2	+7.8	62.2	26 45.0	+8.8	62.6	27 12.3	+9.9	63.1	33
34	23 55.1	+2.3	59.0	24 25.8	+3.3	59.4	24 56.2	+4.2	59.8	25 05.6	-0.3	48.0	26 36.5	+0.5	48.4	27 16.2	+1.4	48.8	27 55.5	+2.4	49.2	28 34.6	+3.2	49.6	45
35	23 57.4	+1.9	57.9	24 29.1	+2.8	58.3	25 00.4	+3.8	58.7	25 31.4	+4.8	59.1	26 02.0	+5.8	59.5	26 32.2	+6.8	60.0	27 02.1	+7.7	60.4	27 31.5	+8.8	60.9	35
36	23 59.3	+1.4	56.9	24 31.9	+2.4	57.2	25 04.2	+3.3	57.6	25 36.2	+4.3	58.0	26 07.8	+5.2	58.4	26 39.0	+6.2	58.9	27 09.8	+7.3	59.3	27 40.3	+8.2	59.7	36
37	24 00.7	+0.9	55.8	24 34.3	+1.8	56.1	25 07.5	+2.8	56.5	25 40.5	+3.7	56.9	26 13.0	+4.8	57.3	26 45.2	+5.8	57.7	27 17.1	+6.7	58.2	27 48.5	+7.7	58.6	37
38																									

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 71° , 289°

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.								
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z									
0	18	19.7	-16.5	95.1	18	14.2	-17.5	95.4	18	08.4	-18.6	95.7	18	02.2	-19.6	96.1	17	55.7	-20.7	96.4	17	48.9	-21.7	96.7	17	41.7	-22.7	97.0	17	34.2	-23.7	97.3	0
1	18	03.2	-16.8	96.1	17	56.7	-17.9	96.4	17	49.8	-18.9	96.7	17	42.6	-20.0	97.1	17	35.0	-20.9	97.4	17	27.2	-22.0	97.7	17	19.0	-23.0	98.0	17	10.5	-24.0	98.3	1
2	17	46.4	-17.1	97.1	17	38.8	-18.2	97.4	17	30.9	-19.2	97.7	17	22.6	-20.2	98.1	17	14.1	-21.3	98.4	17	05.2	-22.3	98.7	16	56.0	-23.3	99.0	16	46.5	-24.3	99.3	2
3	17	29.3	-17.5	98.1	17	20.6	-18.5	98.4	17	11.7	-19.5	98.7	17	02.4	-20.5	99.0	16	52.8	-21.5	99.3	16	42.9	-22.5	99.6	16	32.7	-23.5	99.9	16	22.2	-24.5	100.2	3
4	17	11.8	-17.7	99.1	17	02.1	-18.7	99.4	16	52.2	-19.8	99.7	16	41.9	-20.8	100.0	16	31.3	-21.8	100.3	16	20.4	-22.8	100.6	16	09.2	-23.8	100.9	15	57.7	-24.8	101.2	4
5	16	54.1	-18.1	100.1	16	43.4	-19.1	100.4	16	32.4	-20.1	100.7	16	21.1	-21.1	101.0	16	09.5	-22.1	101.3	15	57.6	-23.1	101.6	15	45.4	-24.0	101.8	15	32.9	-25.0	102.1	5
6	16	36.0	-18.3	101.1	16	24.3	-19.3	101.4	16	12.3	-20.3	101.7	16	0.0	-21.3	102.0	15	47.4	-22.3	102.3	15	34.5	-23.3	102.5	15	21.4	-24.3	102.8	15	07.9	-25.2	103.1	6
7	16	17.7	-18.6	102.1	16	05.0	-19.6	102.4	15	52.0	-20.6	102.7	15	38.7	-21.6	102.9	15	25.1	-22.6	103.2	15	11.2	-23.5	103.5	14	57.1	-24.5	103.7	14	42.7	-25.4	104.0	7
8	15	59.1	-18.8	103.1	15	45.4	-19.3	103.4	15	31.4	-20.9	103.6	15	17.1	-21.9	103.9	15	02.5	-22.8	104.2	14	47.7	-23.8	104.4	14	32.6	-24.7	104.7	14	17.3	-25.7	104.9	8
9	15	40.3	-19.2	104.1	15	25.5	-20.1	104.4	15	10.5	-21.1	104.6	14	55.2	-22.0	104.9	14	39.7	-23.0	105.1	14	23.9	-24.0	105.4	14	07.9	-25.0	105.6	13	51.6	-25.9	105.9	9
10	15	21.1	-19.3	105.1	15	05.4	-20.4	105.3	14	49.4	-21.3	105.6	14	33.2	-22.4	105.8	14	16.7	-23.3	106.1	13	59.9	-24.2	106.3	13	42.9	-25.1	106.6	13	25.7	-26.1	106.8	10
11	15	01.8	-19.7	106.1	14	45.0	-20.6	106.3	14	28.1	-21.6	106.6	14	10.8	-22.5	106.8	13	53.4	-23.5	107.0	13	35.7	-24.4	107.3	13	17.8	-25.4	107.5	12	59.6	-26.3	107.7	11
12	14	42.1	-19.9	107.0	14	24.4	-20.8	107.3	14	06.5	-21.8	107.5	13	48.3	-22.8	107.8	13	29.9	-23.7	108.0	13	11.3	-24.7	108.2	12	52.4	-25.6	108.4	12	33.3	-26.5	108.6	12
13	14	22.2	-20.1	108.0	14	03.6	-21.1	108.2	13	44.7	-22.1	108.5	13	25.5	-22.9	108.7	13	06.2	-23.9	108.9	12	46.6	-24.8	109.1	12	26.8	-25.7	109.4	12	06.8	-26.6	109.6	13
14	14	02.1	-20.3	109.0	13	42.5	-21.3	109.2	13	22.6	-22.2	109.4	13	02.6	-23.2	109.7	12	42.3	-24.1	109.9	12	21.8	-25.0	110.1	12	01.1	-26.0	110.3	11	40.2	-26.8	110.5	14
15	13	41.8	-20.6	109.9	13	21.2	-21.5	110.2	13	00.4	-22.5	110.4	12	39.4	-23.4	110.6	12	18.2	-24.3	110.8	11	56.8	-25.3	111.0	11	35.1	-26.1	111.2	11	13.4	-27.0	111.4	15
16	13	21.2	-20.8	110.9	12	59.7	-21.4	111.1	12	37.9	-22.6	111.3	12	16.0	-23.6	111.5	11	53.9	-24.5	111.7	11	31.5	-25.3	111.9	11	09.0	-26.2	112.1	10	46.4	-27.2	112.3	16
17	13	00.4	-21.0	111.9	12	37.9	-21.9	112.1	12	15.3	-22.9	112.3	11	52.4	-23.7	112.5	11	29.4	-24.7	112.7	11	06.2	-25.6	112.9	10	42.8	-26.5	113.0	10	19.2	-27.3	113.2	17
18	12	39.4	-21.2	112.8	12	16.0	-22.1	113.0	11	52.4	-23.0	113.2	11	28.7	-24.0	113.4	11	04.7	-24.8	113.6	10	40.6	-25.7	113.8	10	16.3	-26.5	114.0	9	51.9	-27.4	114.1	18
19	12	18.2	-21.4	113.8	11	53.9	-22.4	114.0	11	29.4	-23.2	114.2	11	04.7	-24.1	114.4	10	39.9	-25.0	114.5	10	14.9	-25.9	114.7	9	49.8	-26.2	114.9	9	24.5	-27.6	115.0	19
20	11	56.8	-21.7	114.7	11	31.5	-22.5	114.9	11	06.2	-23.4	115.1	10	40.6	-24.3	115.3	10	14.9	-25.1	115.5	9	49.0	-26.0	115.6	9	23.0	-26.8	115.8	8	56.9	-27.7	115.9	20
21	11	35.1	-21.7	115.7	11	09.0	-22.6	115.9	10	42.8	-23.6	116.1	10	16.3	-24.4	116.2	9	49.8	-25.3	116.4	9	23.0	-26.1	116.5	8	29.2	-27.9	116.8	21				
22	11	13.4	-22.0	116.7	10	46.4	-22.9	116.8	10	19.2	-23.7	117.0	9	51.9	-24.6	117.1	9	24.5	-25.5	117.3	8	56.9	-26.3	117.4	8	29.2	-27.2	117.6	22				
23	10	51.4	-22.2	117.6	10	23.5	-23.0	117.8	9	55.5	-23.9	117.9	9	27.3	-24.7	118.1	8	59.0	-25.6	118.2	8	30.6	-26.4	118.4	8	02.0	-27.2	118.5	7	33.4	-28.1	118.6	23
24	10	29.2	-22.3	118.5	10	00.5	-23.2	118.7	9	31.6	-24.0	118.9	9	02.6	-24.9	119.0	8	33.4	-25.7	119.1	7	34.8	-27.4	119.4	7	05.3	-28.2	119.5	24				
25	10	06.9	-22.5	119.5	9	37.3	-23.3	119.6	9	07.6	-24.2	119.8	8	37.7	-25.0	119.9	8	07.7	-25.8	120.0	7	37.6	-26.6	120.2	7	07.4	-27.4	120.3	25				
26	9	44.4	-22.6	120.4	9	14.0	-23.5	120.6	8	43.4	-24.3	120.7	8	12.7	-25.1	120.8	7	41.9	-25.9	121.0	7	11.0	-26.8	121.1	6	40.0	-27.6	121.2	26				
27	9	21.8	-22.8	121.4	8	50.5	-23.6	121.5	8	19.1	-24.4	121.6	7	47.6	-25.3	121.8	7	16.0	-26.1	121.9	6	44.2	-26.8	122.0	6	12.4	-27.6	122.1	27				
28	8	59.0	-22.9	122.3	8	26.9	-23.7	122.4	7	54.7	-24.6	122.6	7	22.3	-25.3	122.7	6	49.9	-26.2	122.8	6	17.4	-27.0	122.9	5	44.8	-27.8	123.0	28				
29	8	36.1	-23.0	123.2	8	03.2	-23.8	123.4	7	30.1	-24.6	123.5	6	57.0	-25.5	123.6	6	23.7	-26.2	123.7	5	50.4	-27.0	123.8	5	17.0	-27.8	123.9	29				
30	8	13.1	-23.2	124.2	7	39.3	-24.0	124.3	7	05.5	-24.8	124.4	6	31.5	-25.5	124.5	5	57.5	-26.3	124.6	5	23.4	-27.1	124.7	4	49.2	-27.8	124.8	30				
31	7	49.9	-23.3	125.1	7	15.3	-24.1	125.2	6	40.7	-24.9	125.3	6	0.0	-25.7	125.4	5	31.2	-26.5	125.5	4	56.3	-27.2	125.6	3	46.4	-28.7	125.7	31				
32	7	26.6	-23.5	126.0	6	51.2	-24.2	126.1	6	15.8	-25.0	126.2	5	40.3	-25.7	126.3	5	04.7	-26.4	126.4	4	29.1	-27.1	126.5	3	17.7	-28.7	126.6	32				
33	7	03.1	-23.5	127.0	6	27.0	-24.3	127.1	5	50.8	-25.0	127.1	5	14.6	-25.8	127.2	4	38.3	-26.6	127.3	4	0.19	-27.3	127.4	2	49.0	-28.8	127.4	33				
34	6	39.6	-23.6	127.9	6	10.4	-24.9	128.0	6	46.1	-25.6	128.0	6	01.5	-26.2	128.0	5	43.1	-26.9														

72°, 288° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180°Zn=7
L.H.A. less than 180°Zn=360°-Z

	15°			16°			17°			18°			19°			20°			21°			22°			Dec.								
Dec.	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Dec.								
0	17	22.0	+16.1	94.8	17	16.8	+17.2	95.1	17	11.3	+18.2	95.4	17	05.5	+19.2	95.7	16	59.3	+20.3	96.0	16	52.8	+21.4	96.3	16	46.1	+22.3	96.6	16	39.0	+23.3	96.9	0
1	17	38.1	+15.8	93.8	17	34.0	+16.9	94.1	17	29.5	+17.9	94.4	17	24.7	+19.0	94.7	17	19.6	+20.0	95.1	17	14.2	+21.0	95.4	17	08.4	+22.0	95.7	17	02.3	+23.0	96.0	1
2	17	53.9	+15.5	92.8	17	50.9	+16.5	93.1	17	47.4	+17.6	93.4	17	43.7	+18.6	93.7	17	39.6	+19.7	94.1	17	35.2	+20.7	94.4	17	30.4	+21.8	94.7	17	25.3	+22.8	95.0	2
3	18	09.4	+15.2	91.8	18	07.4	+16.2	92.1	18	05.0	+17.3	92.4	18	02.3	+18.4	92.7	17	59.3	+19.4	93.1	17	55.9	+20.4	93.4	17	52.2	+21.4	93.7	17	48.1	+22.5	94.0	3
4	18	24.6	+14.8	90.7	18	23.6	+16.0	91.1	18	22.3	+17.0	91.4	18	20.7	+18.0	91.7	18	18.7	+19.1	92.1	18	16.3	+20.2	92.4	18	13.6	+21.2	92.7	18	10.6	+22.2	93.1	4
5	18	39.4	+14.6	89.7	18	36.6	+15.5	90.1	18	33.3	+16.7	90.4	18	38.7	+17.7	90.7	18	37.8	+18.7	91.1	18	36.5	+19.8	91.4	18	34.8	+20.8	91.8	18	32.8	+21.9	92.1	5
6	18	54.0	+14.1	88.7	18	55.1	+15.3	89.0	18	56.0	+16.3	89.4	18	56.4	+17.4	89.7	18	56.5	+18.5	90.1	18	56.3	+19.5	90.4	18	55.6	+20.6	90.8	18	54.7	+21.5	91.1	6
7	19	08.1	+13.9	87.7	19	10.4	+14.9	88.0	19	12.3	+16.0	88.4	19	13.8	+17.0	88.7	19	15.0	+18.1	89.1	19	15.8	+19.1	89.4	19	16.2	+20.2	89.8	19	16.2	+21.3	90.1	7
8	19	22.0	+13.4	86.6	19	25.3	+14.6	87.0	19	28.3	+15.6	87.3	19	30.8	+16.8	87.7	19	33.1	+17.7	88.1	19	34.9	+18.8	88.4	19	36.4	+19.9	88.8	19	37.5	+20.9	89.1	8
9	19	35.4	+13.2	85.6	19	39.9	+14.2	86.0	19	43.9	+15.3	86.3	19	47.6	+16.3	86.7	19	50.8	+17.5	87.0	19	53.7	+18.5	87.4	19	56.3	+19.5	87.8	19	58.4	+20.6	88.1	9
10	19	48.6	+12.7	84.6	19	54.1	+13.8	84.9	19	59.2	+14.9	85.3	20	03.9	+16.0	85.7	20	08.3	+17.0	86.0	20	12.2	+18.2	86.4	20	15.8	+19.2	86.8	20	19.0	+20.3	87.1	10
11	20	01.3	+12.5	83.5	20	07.9	+13.5	83.9	20	14.1	+14.6	84.3	20	19.9	+15.6	84.6	20	25.3	+16.7	85.0	20	30.4	+17.7	85.4	20	35.0	+18.8	85.7	20	39.3	+19.9	86.1	11
12	20	13.8	+12.0	82.5	20	21.4	+13.1	82.9	20	28.7	+14.2	83.2	20	35.5	+15.3	83.6	20	42.0	+16.4	84.0	20	48.1	+17.5	84.4	20	53.8	+18.5	84.7	20	59.2	+19.5	85.1	12
13	20	25.8	+11.6	81.4	20	34.5	+12.8	81.8	20	42.9	+13.8	82.2	20	50.8	+14.9	82.6	20	58.4	+16.0	82.9	21	05.6	+17.0	83.3	21	12.3	+18.1	83.7	21	18.7	+19.2	84.1	13
14	20	37.4	+11.3	80.4	20	47.3	+12.3	80.8	20	56.7	+13.4	81.1	21	05.7	+14.5	81.5	21	14.4	+15.6	81.9	21	22.6	+16.7	82.3	21	30.4	+17.8	82.7	21	37.9	+18.8	83.1	14
15	20	48.7	+10.9	79.4	20	59.6	+12.0	79.7	21	10.1	+13.1	80.1	21	20.2	+14.2	80.5	21	30.0	+15.2	80.9	21	39.3	+16.2	81.3	21	48.2	+17.3	81.7	21	56.7	+18.4	82.1	15
16	20	59.6	+10.5	78.3	21	11.6	+11.6	78.7	21	23.2	+12.6	79.1	21	34.4	+13.7	79.4	21	45.2	+14.8	79.8	21	55.5	+15.9	80.2	22	05.5	+17.0	80.6	22	15.1	+18.0	81.0	16
17	21	10.1	+10.1	77.2	21	23.2	+11.2	77.6	21	35.8	+12.3	78.0	21	48.1	+13.4	78.4	22	00.0	+14.4	78.8	22	11.4	+15.5	79.2	22	22.5	+16.5	79.6	22	33.1	+17.6	80.0	17
18	21	20.2	+9.8	76.2	21	34.4	+10.8	76.6	21	48.1	+11.9	77.0	22	01.5	+12.9	77.3	22	14.4	+14.0	77.7	22	26.9	+15.1	78.1	22	39.0	+16.2	78.6	22	50.7	+17.3	79.0	18
19	21	30.0	+9.3	75.1	21	45.2	+10.3	75.5	22	00.0	+11.4	75.9	22	14.4	+12.5	76.3	22	28.4	+13.6	76.7	22	42.0	+14.7	77.1	22	55.2	+15.8	77.5	23	08.0	+16.8	77.9	19
20	21	39.3	+8.9	74.1	21	55.5	+10.0	74.4	22	11.4	+11.1	74.8	22	26.9	+12.1	75.2	22	42.0	+13.2	75.6	22	56.7	+14.3	76.0	23	11.0	+15.3	76.5	23	24.8	+16.4	76.9	20
21	21	48.2	+8.5	73.0	22	05.5	+9.6	73.4	22	22.5	+10.6	73.8	22	39.0	+11.7	74.2	22	55.2	+12.8	74.6	23	11.0	+13.8	75.0	23	26.3	+14.9	75.4	23	41.2	+16.0	75.8	21
22	21	56.7	+8.1	71.9	22	15.1	+9.1	72.3	22	33.1	+10.2	72.7	22	50.7	+11.3	73.1	23	08.0	+12.3	73.5	23	24.8	+13.4	73.9	23	41.2	+14.5	74.3	23	57.2	+15.5	74.8	22
23	22	04.8	+7.6	70.9	22	24.2	+8.8	71.2	22	43.3	+9.8	71.6	23	02.0	+10.9	72.0	23	20.3	+11.9	72.5	23	38.2	+13.0	72.9	23	55.7	+14.0	73.3	24	12.7	+15.1	73.7	23
24	22	12.4	+7.3	69.8	22	33.0	+8.2	70.2	22	53.1	+9.4	70.6	23	12.9	+10.4	71.0	23	32.2	+11.5	71.4	23	51.2	+12.5	71.8	24	09.7	+13.6	72.2	24	27.8	+14.7	72.7	24
25	22	19.7	+6.8	68.7	22	41.2	+7.9	69.1	23	02.5	+8.9	69.5	23	23.3	+9.9	69.9	23	43.7	+11.0	70.3	24	03.7	+12.1	70.7	24	23.3	+13.1	71.2	24	42.5	+14.2	71.6	25
26	22	26.5	+6.4	67.6	22	49.1	+7.4	68.0	23	11.4	+8.4	68.4	23	33.2	+9.6	68.8	23	54.7	+10.6	69.2	24	15.8	+11.6	69.7	24	36.4	+12.7	70.1	24	56.7	+13.7	70.5	26
27	22	32.9	+5.9	66.6	22	56.5	+7.0	67.0	23	19.8	+8.1	67.3	23	42.8	+9.0	67.7	24	05.3	+10.1	68.2	24	27.4	+11.2	68.6	24	49.1	+12.2	69.0	25	10.4	+13.3	69.4	27
28	22	38.8	+5.6	65.5	23	03.5	+6.6	65.9	23	27.9	+7.6	66.3	23	51.8	+8.7	66.7	24	15.4	+9.7	67.1	24	38.6	+10.7	67.5	25	01.3	+11.8	67.9	25	23.7	+12.8	68.4	28
29	22	44.4	+5.1	64.4	23	10.1	+6.1	64.8	23	35.5	+7.1	65.2	24	00.5	+8.1	65.6	24	25.1	+9.2	66.0	24	49.3	+10.2	66.4	25	13.1	+11.2	66.8	25	36.5	+12.3	67.3	29
30	22	49.5	+4.6	63.3	23	16.2	+5.7	63.7	23	42.6	+6.7	64.1	24	08.6	+7.7	64.5	24	34.3	+8.7	64.9	24	59.5	+9.8	65.3	25	24.3	+10.8	65.8	25	48.8	+11.8	66.2	30
31	22	54.1	+4.2	62.2	23	21.9	+5.2	62.6	23	49.3	+6.2	63.0	24	16.3	+7.3	63.4	24	43.0	+8.2	63.8	25	09.3	+9.2	64.2	25	35.1	+10.3	64.7	31				
32	22	58.3	+3.8	61.2	23	27.1	+4.8	61.5	23	55.5	+5.8	61.9	24	23.6	+6.7	62.3	24	51.2	+7.8	62.7	25	18.5	+8.3	63.1	25	45.4	+9.9	63.6	26	11.9	+10.9	64.0	32
33	23	02.1	+3.3	60.1	23	31.9	+4.3	60.5	24	01.3	+5.3	60.8	24	30.3	+6.3	61.2	24	59.0	+7.3	61.6	25	27.3	+8.3	62.1	25	55.3	+9.3	62.5	26				
34																																	

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 72°, 288°

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.								
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z									
0	17	22.0	-16.4	94.8	17	16.8	-17.5	95.1	17	11.3	-18.5	95.4	17	05.5	-19.6	95.7	16	59.3	-20.6	96.0	16	52.8	-21.5	96.3	16	46.1	-22.6	96.6	16	39.0	-23.6	96.9	0
1	17	05.6	-16.7	95.8	16	59.3	-17.7	96.1	16	52.8	-18.8	96.4	16	45.9	-19.8	96.7	16	38.7	-20.8	97.0	16	31.3	-21.9	97.3	16	23.5	-22.9	97.6	16	15.4	-23.9	97.9	1
2	16	48.9	-17.0	96.8	16	41.6	-18.1	97.1	16	34.0	-19.1	97.4	16	26.1	-20.1	97.7	16	17.9	-21.1	98.0	16	09.4	-22.1	98.3	16	00.6	-23.1	98.6	15	51.5	-24.1	98.9	2
3	16	31.9	-17.3	97.8	16	23.5	-18.3	98.1	16	14.9	-19.3	98.4	16	06.0	-20.4	98.7	15	56.8	-21.4	99.0	15	47.3	-22.4	99.3	15	37.5	-23.4	99.5	15	27.4	-24.3	99.8	3
4	16	14.6	-17.6	98.8	16	05.2	-18.6	99.1	15	55.6	-19.6	99.4	15	45.6	-20.6	99.7	15	35.4	-21.6	99.9	15	24.9	-22.6	100.2	15	14.1	-23.6	100.5	15	03.1	-24.6	100.8	4
5	15	57.0	-17.9	99.8	15	46.6	-18.2	100.1	15	36.0	-19.9	100.4	15	25.0	-20.9	100.6	15	13.8	-21.9	100.9	15	02.3	-22.9	101.2	14	50.5	-23.8	101.4	14	38.5	-24.8	101.7	5
6	15	39.1	-18.1	100.8	15	27.7	-19.1	101.1	15	16.1	-20.2	101.3	15	04.1	-21.1	101.6	14	51.9	-22.1	101.9	14	39.4	-23.0	102.1	14	26.7	-24.1	102.4	14	13.7	-25.0	102.6	6
7	15	21.0	-18.4	101.8	15	08.6	-19.4	102.1	14	55.9	-20.3	102.3	14	43.0	-21.4	102.6	14	29.8	-22.3	102.8	14	16.4	-23.4	103.1	14	02.6	-24.2	103.3	13	48.7	-25.3	103.6	7
8	15	02.6	-18.6	102.8	14	49.2	-19.6	103.0	14	35.6	-20.7	103.3	14	21.6	-21.6	103.5	14	07.5	-22.6	103.8	13	53.0	-23.5	104.0	13	38.4	-24.5	104.3	13	23.4	-25.4	104.5	8
9	14	44.0	-18.9	103.8	14	29.6	-19.6	104.0	14	14.9	-20.8	104.3	14	00.0	-21.8	104.5	13	44.9	-22.8	104.7	13	29.5	-23.8	105.0	13	13.9	-24.7	105.2	12	58.0	-25.6	105.4	9
10	14	25.1	-19.1	104.7	14	09.7	-20.1	105.0	13	54.1	-21.1	105.2	13	38.2	-22.0	105.5	13	22.1	-23.0	105.7	13	05.7	-23.9	105.9	12	49.2	-24.9	106.1	12	32.4	-25.9	106.4	10
11	14	06.0	-19.3	105.7	13	49.6	-20.3	106.0	13	33.0	-21.3	106.2	13	16.2	-22.3	106.4	12	59.1	-23.2	106.6	12	41.8	-24.2	106.9	12	24.3	-25.1	107.1	12	06.5	-26.0	107.3	11
12	13	46.7	-19.6	106.7	13	29.3	-20.6	106.9	13	11.7	-21.5	107.2	12	53.9	-22.5	107.4	12	35.9	-23.4	107.6	12	17.6	-24.3	107.8	11	59.2	-25.3	108.0	11	40.5	-26.2	108.2	12
13	13	27.1	-19.8	107.7	13	08.7	-20.7	107.9	12	50.2	-21.7	108.1	12	31.4	-22.6	108.3	12	12.5	-23.6	108.5	11	53.3	-24.5	108.7	11	33.9	-25.4	108.9	11	14.3	-26.3	109.1	13
14	13	07.3	-20.1	108.6	12	48.0	-21.0	108.9	12	28.5	-22.0	109.1	12	08.8	-22.9	109.3	11	48.9	-23.8	109.5	11	28.8	-24.8	109.7	11	08.5	-25.6	109.9	10	48.0	-26.5	110.0	14
15	12	47.2	-20.2	109.6	12	27.0	-21.2	109.8	12	06.5	-22.1	110.0	11	45.9	-23.0	110.2	11	25.1	-24.0	110.4	11	04.0	-24.8	110.6	10	21.5	-26.7	111.0	15				
16	12	27.0	-20.5	110.6	12	05.8	-21.4	110.8	11	44.4	-22.3	111.0	11	01.1	-24.1	111.3	10	39.2	-25.1	111.5	10	17.1	-26.0	111.7	9	54.8	-26.8	111.9	16				
17	12	06.5	-20.6	111.5	11	44.4	-21.5	111.7	11	22.1	-22.5	111.9	10	59.6	-23.4	112.1	10	37.0	-24.3	112.3	10	14.1	-25.2	112.5	9	51.1	-26.0	112.6	9				
18	11	45.9	-20.8	112.5	11	22.9	-21.8	112.7	10	59.6	-22.6	112.9	10	36.2	-23.5	113.0	10	12.7	-24.5	113.2	9	48.9	-25.3	113.4	9	01.0	-27.0	113.7	18				
19	11	25.1	-21.1	113.5	11	01.1	-21.8	113.6	10	37.0	-22.9	113.8	10	12.7	-23.8	114.0	9	48.2	-24.6	114.1	9	23.6	-25.5	114.3	8	58.6	-26.3	114.4	19				
20	11	04.0	-21.1	114.4	10	39.2	-22.1	114.6	10	14.1	-23.0	114.7	9	48.9	-23.8	114.9	9	23.6	-24.8	115.1	8	58.1	-25.6	115.2	8	06.7	-27.3	115.5	20				
21	10	42.9	-21.4	115.4	10	17.1	-22.3	115.5	9	51.1	-23.1	115.7	9	25.1	-24.1	115.8	8	58.8	-24.8	116.0	8	32.5	-25.8	116.1	7	39.4	-27.4	116.4	21				
22	10	21.5	-21.6	116.3	9	54.8	-22.4	116.5	9	28.0	-23.3	116.6	9	01.0	-24.1	116.8	8	34.0	-25.1	116.9	8	06.7	-26.5	117.0	7	39.4	-27.4	117.3	22				
23	9	59.9	-21.7	117.3	9	32.4	-22.6	117.4	9	04.7	-23.4	117.6	8	36.9	-24.3	117.7	8	08.9	-25.1	117.8	7	40.9	-26.0	117.9	7	12.7	-26.8	118.1	6				
24	9	38.2	-21.8	118.2	9	09.8	-22.7	118.3	8	41.3	-23.6	118.5	8	12.6	-24.4	118.6	7	43.8	-25.3	118.7	7	14.9	-26.1	118.9	6	16.8	-27.8	119.1	24				
25	9	16.4	-22.0	119.1	8	47.1	-22.9	119.3	8	17.7	-23.7	119.4	7	48.2	-24.6	119.5	7	18.5	-25.4	119.7	6	48.8	-26.2	119.8	6	19.0	-27.1	119.9	5				
26	8	54.4	-22.2	120.1	8	24.2	-22.9	120.2	7	54.0	-23.8	120.3	7	23.6	-24.6	120.5	6	53.1	-25.4	120.6	6	22.6	-26.3	120.7	5	51.9	-27.1	120.8	26				
27	8	32.2	-22.2	121.0	8	01.3	-23.2	121.2	7	30.2	-24.0	121.3	6	59.0	-24.8	121.4	6	27.7	-25.6	121.5	5	56.3	-26.4	121.6	5	24.8	-27.1	121.7	27				
28	8	10.0	-22.5	122.0	7	38.1	-23.2	122.1	7	06.2	-24.0	122.2	6	34.2	-24.9	122.3	6	20.1	-25.7	122.4	5	29.9	-26.4	122.5	4	25.4	-28.1	122.6	28				
29	7	47.5	-22.5	122.9	7	14.9	-23.3	123.0	6	42.2	-24.2	123.1	6	09.3	-24.9	123.2	5	36.4	-25.7	123.3	5	03.5	-26.5	123.4	4	30.4	-27.3	123.5	29				
30	7	25.0	-22.6	123.8	6	51.6	-23.5	123.9	6	18.0	-24.2	124.0	5	44.4	-25.1	124.1	5	10.7	-25.8	124.2	4	36.9	-26.6	124.3	4	03.1	-27.4	124.4	30				
31	7	02.4	-22.8	124.8	6	28.1	-23.6	124.9	5	53.8	-24.4	125.0	5	19.3	-25.1	125.0	4	44.9	-25.9	125.1	4	10.3	-26.6	125.2	3	01.1	-28.2	125.3	31				
32	6	39.6	-22.9	125.7	6	04.5	-23.6	125.8	5	29.4	-24.4	125.9	5	05.0	-24.2	126.0	5	41.9	-25.6	126.0	5	33.7	-26.7	126.1	2	32.9	-28.2	126.2	32				
33	6	16.7	-22.9	126.6	5	40.9	-23.7	126.7	5	05.0	-24.5	126.8	4	29.0	-25.2	126.9	3	53.0	-26.0	126.9	3	16.9	-26.7	127.0	2	04.7	-28.2	127.0	33				
34	5	53.8	-23.1	127.6	4	53.3	-24.8	127.7	4	05.0	-24.6	127.8	4	07.6	-25.4	127.9	3	27.0	-26.1	127.8	2	13.3	-27.5	127.9	1	36.5	-28.3	128.0	34				
35	5	30.7	-23.1	128.5	4	45.3	-23.8	128.6	3	38.4	-25.3	128.7	3	00.9	-26.1	128.7	2	23.4	-26.9</td														

73°, 287° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180°Zn=7
L.H.A. less than 180°Zn=360°-Z

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.								
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z									
0	16	24.2	+16.1	94.5	16	19.4	+17.0	94.8	16	14.2	+18.1	95.1	16	08.7	+19.1	95.4	16	02.9	+20.2	95.7	15	56.8	+21.2	96.0	15	50.4	+22.2	96.3	15	43.7	+23.2	96.5	0
1	16	40.3	+15.7	93.5	16	36.4	+16.9	93.8	16	32.3	+17.8	94.1	16	27.8	+18.9	94.4	16	23.1	+19.9	94.7	16	18.0	+20.9	95.0	16	12.6	+22.0	95.3	16	06.9	+23.0	95.6	1
2	16	56.0	+15.5	92.5	16	53.3	+16.5	92.8	16	50.1	+17.6	93.1	16	46.7	+18.6	93.4	16	43.0	+19.6	93.7	16	38.9	+20.7	94.0	16	34.6	+21.7	94.3	16	29.9	+22.7	94.6	2
3	17	11.5	+15.1	91.5	17	09.8	+16.2	91.8	17	07.7	+17.3	92.1	17	05.3	+18.3	92.4	17	02.6	+19.4	92.7	16	59.6	+20.4	93.0	16	56.3	+21.4	93.3	16	52.6	+22.4	93.6	3
4	17	26.6	+14.9	90.5	17	26.0	+15.9	90.8	17	25.0	+16.9	91.1	17	23.6	+18.1	91.4	17	22.0	+19.0	91.7	17	20.0	+20.1	92.1	17	17.7	+21.1	92.4	17	15.0	+22.2	92.7	4
5	17	41.5	+14.5	89.5	17	41.9	+16.6	89.8	17	41.9	+16.7	90.1	17	41.7	+17.7	90.4	17	41.0	+18.8	90.7	17	40.1	+19.8	91.1	17	38.8	+20.8	91.4	17	37.2	+21.9	91.7	5
6	17	56.0	+14.2	88.5	17	57.5	+15.3	88.8	17	58.6	+16.3	89.1	17	59.4	+17.4	89.4	17	59.8	+18.4	89.7	17	59.5	+19.5	90.1	17	59.6	+20.6	90.4	17	59.1	+21.5	90.7	6
7	18	10.2	+13.9	87.4	18	12.8	+14.9	87.8	18	14.9	+16.0	88.1	18	16.8	+17.0	88.4	18	18.2	+18.2	88.7	18	19.4	+19.2	89.1	18	20.2	+20.2	89.4	18	20.6	+21.3	89.7	7
8	18	24.1	+13.6	86.4	18	27.7	+14.6	86.7	18	30.9	+15.7	87.1	18	33.8	+16.8	87.4	18	36.4	+17.8	87.7	18	38.6	+18.8	88.1	18	40.4	+19.9	88.4	18	41.9	+20.9	88.8	8
9	18	37.7	+13.2	85.4	18	42.3	+14.3	85.7	18	46.6	+15.4	86.1	18	50.6	+16.4	86.4	18	54.2	+17.5	86.7	18	57.4	+18.6	87.1	19	00.3	+19.6	87.4	19	02.8	+20.7	87.8	9
10	18	50.9	+12.9	84.3	18	56.6	+14.0	84.7	19	02.0	+15.0	85.0	19	07.0	+16.1	85.4	19	11.7	+17.1	85.7	19	16.0	+18.2	86.1	19	19.9	+19.3	86.4	19	23.5	+20.3	86.8	10
11	19	03.8	+12.5	83.3	19	10.6	+13.6	83.7	19	17.0	+14.7	84.0	19	23.1	+15.8	84.4	19	28.8	+16.8	84.7	19	34.2	+17.8	85.1	19	39.2	+18.9	85.4	19	43.8	+19.9	85.8	11
12	19	16.3	+12.2	82.3	19	24.2	+13.2	82.6	19	31.7	+14.3	83.0	19	38.9	+15.4	83.3	19	45.6	+16.5	83.7	19	52.0	+17.6	84.0	19	58.1	+18.6	84.4	20	03.7	+19.7	84.8	12
13	19	28.5	+11.8	81.2	19	37.4	+12.9	81.6	19	46.0	+14.0	81.9	19	54.3	+15.0	82.3	20	02.1	+16.1	82.7	20	09.6	+17.1	83.0	20	16.7	+18.2	83.4	20	23.4	+19.3	83.8	13
14	19	40.3	+11.5	80.2	19	50.3	+12.6	80.6	20	00.0	+13.6	80.9	20	09.3	+14.7	81.3	20	18.2	+15.8	81.6	20	26.7	+16.8	82.0	20	42.7	+18.9	82.8	14				
15	19	51.8	+11.1	79.2	20	02.9	+12.2	79.5	20	13.6	+13.3	79.9	20	24.0	+14.3	80.2	20	34.0	+15.3	80.6	20	43.6	+16.4	81.0	21	01.6	+18.6	81.7	21	51.8	+19.7	82.4	15
16	20	02.9	+10.7	78.1	20	15.1	+11.8	78.5	20	26.9	+12.8	78.8	20	38.3	+13.9	79.2	20	49.3	+15.1	79.6	21	00.0	+16.1	80.0	21	10.3	+17.1	80.3	21	20.2	+18.2	80.7	16
17	20	13.6	+10.4	77.1	20	26.9	+11.4	77.4	20	39.7	+12.5	77.8	20	52.2	+13.6	78.2	21	04.4	+14.6	78.5	21	16.1	+15.7	78.9	21	27.4	+16.8	79.3	21	38.4	+17.8	79.7	17
18	20	24.0	+10.0	76.0	20	38.3	+11.0	76.4	20	52.2	+12.2	76.7	21	05.8	+13.2	77.1	21	19.0	+14.2	77.5	21	31.8	+15.3	77.9	21	44.2	+16.3	78.3	21	56.2	+17.4	78.7	18
19	20	34.0	+9.6	75.0	20	49.3	+10.7	75.3	21	04.4	+11.7	75.7	21	19.0	+12.8	76.1	21	33.2	+13.9	76.5	21	47.1	+14.9	76.8	22	00.5	+16.0	77.2	22	13.6	+17.0	77.6	19
20	20	43.6	+9.2	73.9	21	00.0	+10.3	74.3	21	16.1	+11.3	74.6	21	31.8	+12.4	75.0	21	47.1	+13.4	75.4	22	02.0	+14.5	75.8	22	16.5	+15.6	76.2	22	30.6	+16.7	76.6	20
21	20	52.8	+8.8	72.8	21	10.3	+9.9	73.2	21	27.4	+11.0	73.6	21	44.2	+12.0	74.0	22	00.5	+13.1	74.4	22	16.5	+14.1	74.8	22	32.1	+15.2	75.1	22	47.3	+16.2	75.6	21
22	21	01.6	+8.4	71.8	21	20.2	+9.4	72.2	21	38.4	+10.5	72.5	21	56.2	+11.6	72.9	22	13.6	+12.7	73.3	22	30.6	+13.8	73.7	22	47.3	+14.7	74.5	22				
23	21	10.0	+8.1	70.7	21	29.6	+9.1	71.1	21	48.9	+10.1	71.5	22	07.8	+11.1	71.9	22	26.3	+12.2	72.2	22	44.4	+13.2	72.6	23	02.0	+14.4	73.0	23	19.3	+15.4	73.5	23
24	21	18.1	+7.6	69.7	21	38.7	+8.7	70.0	21	59.0	+9.7	70.4	22	18.9	+10.8	70.8	22	38.5	+11.8	71.2	22	57.6	+12.9	71.6	23	16.4	+13.9	72.0	23	34.7	+15.0	72.4	24
25	21	25.7	+7.2	68.6	21	47.4	+8.3	69.0	22	08.7	+9.3	69.3	22	29.7	+10.4	69.7	22	50.3	+11.4	70.1	23	10.5	+12.4	70.5	23	30.3	+13.5	70.9	23	49.7	+14.5	71.3	25
26	21	32.9	+6.8	67.5	21	55.7	+7.8	67.9	22	18.0	+8.9	68.3	22	40.1	+9.9	68.7	23	01.7	+11.0	69.1	23	22.9	+12.0	69.5	23	43.8	+13.0	69.9	24	04.2	+14.1	70.3	26
27	21	39.7	+6.4	66.5	22	03.5	+7.4	66.8	22	26.9	+8.5	67.2	22	50.0	+9.5	67.6	23	12.7	+10.5	68.0	23	34.9	+11.6	68.4	23	56.8	+12.6	68.8	24	18.3	+13.7	69.2	27
28	21	46.1	+6.0	65.4	22	10.9	+7.0	65.8	22	35.4	+8.0	66.1	22	59.5	+9.0	66.5	23	23.2	+10.1	66.9	23	46.5	+11.1	67.3	24	09.4	+12.2	67.7	24	32.0	+13.2	68.1	28
29	21	52.1	+5.6	64.3	22	17.9	+6.6	64.7	22	43.4	+7.6	65.1	23	08.5	+8.6	65.4	23	33.9	+3.6	65.8	23	57.6	+10.7	66.2	24	21.6	+11.7	66.7	24	45.2	+12.7	67.1	29
30	21	57.7	+5.1	63.3	22	24.5	+6.2	63.6	22	51.0	+7.2	64.0	23	17.1	+8.2	64.4	23	42.9	+9.2	64.8	24	08.3	+10.2	65.2	24	33.3	+11.2	65.6	24	57.9	+12.3	66.0	30
31	22	02.8	+4.8	62.2	22	30.7	+5.7	62.5	22	58.2	+6.7	62.9	23	25.3	+7.8	63.3	23	52.1	+8.7	63.7	24	18.5	+9.8	64.1	24	44.5	+10.8	64.5	25	10.2	+11.8	64.9	31
32	22	07.6	+4.3	61.1	22	36.4	+5.3	61.5	23	04.9	+6.3	61.8	23	33.1	+7.2	62.2	24	00.8	+8.3	62.6	24	28.3	+9.3	63.0	25	55.3	+10.3	63.4	25	22.0	+11.3	63.8	32
33	22	11.9	+3.9	60.0	22	41.7	+4.9	60.4	23	11.2	+5.8	60.8	23	40.3	+6.9	61.1	24	09.1	+7.9	61.5	24	37.6	+8.8	62.3	25	33.3	+10.8	62.7	33				
34																																	

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 73° , 287°

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.								
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z									
0	16	24.2	-16.3	94.5	16	19.4	-17.4	94.8	16	14.2	-18.4	95.1	16	08.7	-19.5	95.4	16	02.9	-20.5	95.7	15	56.8	-21.5	96.0	15	50.4	-22.5	96.3	15	43.7	-23.5	96.5	0
1	16	07.9	-16.6	95.5	16	02.0	-17.7	95.8	15	55.8	-18.7	96.1	15	49.2	-19.7	96.4	15	42.4	-20.7	96.7	15	35.3	-21.7	96.9	15	27.9	-22.7	97.2	15	20.2	-23.7	97.5	1
2	15	51.3	-16.9	96.5	15	44.3	-17.9	96.8	15	37.1	-19.0	97.1	15	29.5	-19.9	97.4	15	21.7	-21.0	97.6	15	13.6	-22.0	97.9	15	05.2	-23.0	98.2	14	56.5	-23.9	98.4	2
3	15	34.4	-17.1	97.5	15	26.4	-18.2	97.8	15	18.1	-19.2	98.1	15	09.6	-20.2	98.3	15	00.7	-21.2	98.6	14	51.6	-22.2	98.9	14	42.2	-23.2	99.1	14	32.6	-24.2	99.4	3
4	15	17.3	-17.4	98.5	15	08.2	-18.4	98.8	14	58.9	-19.4	99.1	14	49.4	-20.5	99.3	14	39.5	-21.4	99.6	14	29.4	-22.4	99.8	14	19.0	-23.4	100.1	14	08.4	-24.4	100.3	4
5	14	59.9	-17.7	99.5	14	49.8	-18.7	99.8	14	39.5	-19.7	100.0	14	28.9	-20.7	100.3	14	18.1	-21.7	100.5	14	07.0	-22.7	100.8	13	55.6	-23.6	101.0	13	44.0	-24.6	101.3	5
6	14	42.2	-17.9	100.5	14	31.1	-18.9	100.8	14	19.8	-19.9	101.0	14	08.2	-20.9	101.3	13	56.4	-21.9	101.5	13	44.3	-22.9	101.7	13	32.0	-23.9	102.0	13	19.4	-24.8	102.2	6
7	14	24.3	-18.2	101.5	14	12.2	-19.2	101.7	13	59.9	-20.2	102.0	13	47.3	-21.2	102.2	13	34.5	-22.2	102.5	13	21.4	-23.1	102.7	13	08.1	-24.1	102.9	12	54.6	-25.1	103.1	7
8	14	06.1	-18.4	102.5	13	53.0	-19.4	102.7	13	39.7	-20.4	102.9	13	26.1	-21.3	103.2	13	12.3	-22.3	103.4	12	58.3	-23.3	103.6	12	44.0	-24.2	103.9	12	29.5	-25.2	104.1	8
9	13	47.7	-18.7	103.4	13	33.6	-19.6	103.7	13	19.3	-20.6	103.9	13	04.8	-21.6	104.1	12	50.0	-22.6	104.4	12	35.0	-23.5	104.6	12	19.8	-24.5	104.8	12	04.3	-25.4	105.0	9
10	13	29.0	-18.8	104.4	13	14.0	-19.9	104.7	12	58.7	-20.8	104.9	12	43.2	-21.8	105.1	12	27.4	-22.7	105.3	12	11.5	-23.7	105.5	11	55.3	-24.6	105.7	11	38.9	-25.5	105.9	10
11	13	10.2	-19.1	105.4	12	54.1	-20.0	105.6	12	37.9	-21.1	105.8	12	21.4	-22.0	106.1	12	04.7	-23.0	106.3	11	47.8	-23.9	106.5	11	30.7	-24.9	106.7	11	13.4	-25.8	106.9	11
12	12	51.1	-19.3	106.4	12	34.1	-20.3	106.6	12	16.8	-21.2	106.8	11	59.4	-22.2	107.0	11	41.7	-23.1	107.2	11	23.9	-24.1	107.4	11	05.8	-24.9	107.6	10	47.6	-25.9	107.8	12
13	12	31.8	-19.5	107.3	12	13.8	-20.5	107.6	11	55.6	-21.4	107.8	11	37.2	-22.4	108.0	10	59.8	-24.2	108.3	10	40.9	-25.2	108.5	10	21.7	-26.0	108.7	13				
14	12	12.3	-19.7	108.3	11	53.3	-20.6	108.5	11	34.2	-21.6	108.7	11	14.8	-22.5	108.9	10	55.3	-23.5	109.1	10	35.6	-24.4	109.3	10	15.7	-25.3	109.4	14				
15	11	52.6	-19.9	109.3	11	32.7	-20.9	109.5	11	12.6	-21.8	109.7	10	52.3	-22.7	109.8	10	31.8	-23.6	110.0	10	11.2	-24.5	110.2	9	50.4	-25.4	110.4	9	29.5	-26.4	110.5	15
16	11	32.7	-20.1	110.2	11	11.8	-21.0	110.4	10	50.8	-22.0	110.6	10	29.6	-22.9	110.8	10	08.2	-23.8	110.9	9	46.7	-24.7	111.1	9	25.0	-26.1	111.3	16				
17	11	12.6	-20.3	111.2	10	50.8	-21.2	111.4	10	28.8	-22.1	111.6	10	06.7	-23.1	111.7	9	44.4	-24.0	111.9	9	22.0	-24.9	112.0	8	59.4	-25.8	112.2	17				
18	10	52.3	-20.5	112.2	10	29.6	-21.4	112.3	10	06.7	-22.3	112.5	9	43.6	-23.2	112.7	9	20.4	-24.0	112.8	8	57.1	-25.0	113.0	8	10.0	-26.7	113.2	18				
19	10	31.8	-20.6	113.1	10	08.2	-21.5	113.3	9	44.4	-22.4	113.4	9	20.4	-23.3	113.6	8	56.4	-24.3	113.7	8	32.1	-25.1	113.9	8	07.8	-26.0	114.0	19				
20	10	11.2	-20.8	114.1	9	46.7	-21.7	114.2	9	22.0	-22.6	114.4	8	57.1	-23.5	114.5	8	32.1	-24.3	114.7	8	07.0	-25.2	114.8	7	41.8	-26.1	114.9	7	16.4	-26.9	115.1	20
21	9	50.4	-20.9	115.0	9	25.0	-21.9	115.2	8	59.4	-22.4	115.3	8	33.6	-23.6	115.5	8	07.8	-24.5	115.6	7	41.8	-25.4	115.8	6	49.5	-27.1	116.0	21				
22	9	29.5	-21.2	116.0	9	03.1	-22.0	116.1	8	36.6	-22.9	116.3	8	10.0	-23.7	116.4	7	43.3	-24.6	116.5	7	16.4	-25.4	116.6	6	22.4	-27.1	116.9	22				
23	9	08.3	-21.2	116.9	8	41.1	-22.1	117.1	8	13.7	-23.0	117.2	7	46.3	-23.9	117.3	7	18.7	-24.7	117.4	6	51.0	-25.6	117.5	6	23.2	-26.4	117.7	23				
24	8	47.1	-21.4	117.9	8	19.0	-22.3	118.0	7	50.7	-23.1	118.1	7	22.4	-24.0	118.2	6	54.0	-24.9	118.4	6	25.4	-25.7	118.5	5	56.8	-26.5	118.6	24				
25	8	25.7	-21.5	118.8	7	56.7	-22.4	118.9	7	27.6	-23.2	119.1	6	58.4	-24.1	119.2	6	29.1	-24.9	119.3	5	59.7	-25.7	119.4	5	30.3	-26.6	119.5	25				
26	8	04.2	-21.7	119.8	7	34.3	-22.5	119.9	7	04.4	-23.4	120.0	6	34.3	-24.2	120.1	6	04.2	-25.0	120.2	5	34.0	-25.4	120.3	5	03.7	-26.6	120.4	26				
27	7	42.5	-21.8	120.7	7	11.8	-22.6	120.8	6	41.0	-23.4	120.9	6	10.1	-24.2	121.0	5	39.2	-25.1	121.1	5	08.2	-25.9	121.2	4	37.1	-26.8	121.3	27				
28	7	20.7	-21.9	121.6	6	49.2	-22.8	121.7	6	17.6	-23.6	121.8	5	45.9	-24.4	121.9	5	14.1	-25.2	122.0	4	42.3	-26.0	122.1	3	10.3	-26.7	122.2	28				
29	6	58.8	-22.0	122.6	6	26.4	-22.8	122.7	5	54.0	-23.6	122.8	5	21.5	-24.5	122.9	4	48.9	-25.2	123.0	3	43.6	-26.9	123.1	3	10.8	-27.6	123.1	29				
30	6	36.8	-22.1	123.5	6	03.6	-22.9	123.6	5	30.4	-23.8	123.7	5	07.0	-24.5	123.8	4	23.7	-25.3	123.9	3	16.7	-26.8	123.9	2	43.2	-27.6	124.0	30				
31	6	14.7	-22.3	124.5	5	40.7	-23.0	124.5	5	06.6	-23.8	124.6	4	32.5	-24.6	124.7	3	24.5	-25.4	124.7	2	15.6	-27.7	124.9	3	03.0	-27.8	124.9	31				
32	5	52.4	-22.3	125.4	5	17.7	-23.1	125.5	4	42.8	-23.9	125.5	4	07.9	-24.6	125.6	3	33.0	-25.5	125.7	2	58.0	-26.2	125.7	2	23.0	-27.0	125.7	32				
33	5	30.1	-22.4	126.3	4	54.6	-23.2	126.4	4	18.9	-23.9	126.5	3	43.3	-24.8	126.5	3	07.5	-25.4	126.6	2	31.8	-26.2	126.6	1	20.2	-27.7	126.7	33				
34	5	07.7	-22.4	127.3	4	13.1	-23.6	127.5	4	31.1	-24.2	127.6	4	05.3	-24.9	127.6	4	08.6	-25.6	127.9	3	02.3	+26.3	128.4	0	24.7	-27.7	128.4	35				
35	4	45.3	-22.6	128.2	4	08.1	-23.3	128.2	3	06.9	-23.6	129.2	2	29.0	-24.9	129.2	1	51.0	-25.6	129.3	0	35.0</											

74°, 286° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180°Zn=7
L.H.A. less than 180°Zn=360°-Z

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	
0	15 26.5 +15.9	94.2	15 21.9 +17.0	94.5	15 17.0 +18.1	94.8	15 11.8 +19.1	95.1	15 06.4 +20.1	95.3	15 00.7 +21.1	95.6	14 54.7 +22.1	95.9	14 48.4 +23.2	96.1	14 48.4 +23.2	96.1	14 48.4 +23.2	96.1	14 48.4 +23.2	96.1	14 48.4 +23.2	96.1	0
1	15 42.4 +15.7	93.2	15 38.9 +16.7	93.5	15 35.1 +17.7	93.8	15 30.9 +18.9	94.1	15 26.5 +19.9	94.4	15 21.8 +20.9	94.6	15 16.8 +21.9	94.9	15 11.6 +22.8	95.2	15 11.6 +22.8	95.2	15 11.6 +22.8	95.2	15 11.6 +22.8	95.2	15 11.6 +22.8	95.2	1
2	15 58.1 +15.5	92.2	15 55.6 +16.5	92.5	15 52.8 +17.6	92.8	15 49.8 +18.5	93.1	15 46.4 +19.6	93.4	15 42.7 +20.6	93.7	15 38.7 +21.6	93.9	15 34.4 +22.7	94.2	15 34.4 +22.7	94.2	15 34.4 +22.7	94.2	15 34.4 +22.7	94.2	15 34.4 +22.7	94.2	2
3	16 13.6 +15.1	91.2	16 12.1 +16.2	91.5	16 10.4 +17.2	91.8	16 08.3 +18.3	92.1	16 06.0 +19.3	92.4	16 03.3 +20.3	92.7	16 00.3 +21.4	93.0	15 57.1 +22.4	93.3	15 57.1 +22.4	93.3	15 57.1 +22.4	93.3	15 57.1 +22.4	93.3	15 57.1 +22.4	93.3	3
4	16 28.7 +14.8	90.2	16 28.3 +15.9	90.5	16 27.6 +17.0	90.8	16 26.6 +18.0	91.1	16 25.3 +19.0	91.4	16 23.6 +20.1	91.7	16 21.7 +21.1	92.0	16 19.5 +22.1	92.3	16 19.5 +22.1	92.3	16 19.5 +22.1	92.3	16 19.5 +22.1	92.3	16 19.5 +22.1	92.3	4
5	16 43.5 +14.6	89.2	16 44.2 +15.6	89.5	16 44.6 +16.6	89.8	16 44.6 +17.7	90.1	16 44.3 +18.8	90.4	16 43.7 +19.8	90.7	16 42.8 +20.8	91.0	16 41.6 +21.8	91.3	16 41.6 +21.8	91.3	16 41.6 +21.8	91.3	16 41.6 +21.8	91.3	16 41.6 +21.8	91.3	5
6	16 58.1 +14.2	88.2	16 59.8 +15.3	88.5	17 01.2 +16.4	88.8	17 02.3 +17.4	89.1	17 03.1 +18.4	89.4	17 03.5 +19.5	89.7	17 03.6 +20.6	90.0	17 03.4 +21.6	90.3	17 03.4 +21.6	90.3	17 03.4 +21.6	90.3	17 03.4 +21.6	90.3	17 03.4 +21.6	90.3	6
7	17 12.3 +14.0	87.2	17 15.1 +15.0	87.5	17 17.6 +16.1	87.8	17 19.7 +17.1	88.1	17 21.5 +18.2	88.4	17 23.0 +19.2	88.7	17 24.2 +20.2	89.1	17 25.0 +21.3	89.4	17 25.0 +21.3	89.4	17 25.0 +21.3	89.4	17 25.0 +21.3	89.4	17 25.0 +21.3	89.4	7
8	17 26.3 +13.6	86.2	17 30.1 +14.7	86.5	17 33.7 +15.7	86.8	17 36.8 +16.9	87.1	17 39.7 +17.9	87.4	17 42.2 +18.9	87.7	17 44.4 +20.0	88.1	17 46.3 +20.9	88.4	17 46.3 +20.9	88.4	17 46.3 +20.9	88.4	17 46.3 +20.9	88.4	17 46.3 +20.9	88.4	8
9	17 39.9 +13.3	85.1	17 44.8 +14.4	85.5	17 49.4 +15.5	85.8	17 53.7 +16.5	86.1	17 57.6 +17.5	86.4	18 01.1 +18.6	86.8	18 04.4 +19.6	87.1	18 07.2 +20.7	87.4	18 07.2 +20.7	87.4	18 07.2 +20.7	87.4	18 07.2 +20.7	87.4	18 07.2 +20.7	87.4	9
10	17 53.2 +13.0	84.1	17 59.2 +14.1	84.4	18 04.9 +15.1	84.8	18 10.2 +16.1	85.1	18 15.1 +17.3	85.4	18 19.7 +18.3	85.8	18 24.0 +19.3	86.1	18 27.9 +20.4	86.4	18 27.9 +20.4	86.4	18 27.9 +20.4	86.4	18 27.9 +20.4	86.4	18 27.9 +20.4	86.4	10
11	18 06.2 +12.7	83.1	18 13.3 +13.7	83.4	18 20.0 +14.8	83.7	18 26.3 +15.9	84.1	18 32.4 +16.9	84.4	18 38.0 +18.0	84.7	18 43.3 +19.1	85.1	18 48.3 +20.1	85.4	18 48.3 +20.1	85.4	18 48.3 +20.1	85.4	18 48.3 +20.1	85.4	18 48.3 +20.1	85.4	11
12	18 18.9 +12.3	82.1	18 27.0 +13.4	82.4	18 34.8 +14.4	82.7	18 42.2 +15.5	83.1	18 49.3 +16.6	83.4	18 56.0 +17.6	83.7	19 02.4 +18.6	84.1	19 08.4 +19.7	84.4	19 08.4 +19.7	84.4	19 08.4 +19.7	84.4	19 08.4 +19.7	84.4	19 08.4 +19.7	84.4	12
13	18 31.2 +12.0	81.0	18 40.4 +13.1	81.4	18 49.2 +14.2	81.7	18 57.7 +15.2	82.0	19 05.9 +16.2	82.4	19 13.6 +17.3	82.7	19 21.0 +18.4	83.1	19 28.1 +19.4	83.4	19 28.1 +19.4	83.4	19 28.1 +19.4	83.4	19 28.1 +19.4	83.4	19 28.1 +19.4	83.4	13
14	18 43.2 +11.7	80.0	18 53.5 +12.7	80.3	19 03.4 +13.8	80.7	19 12.9 +14.9	81.0	19 22.1 +15.9	81.4	19 30.9 +17.0	81.7	19 39.4 +18.0	82.1	19 47.5 +19.1	82.4	19 47.5 +19.1	82.4	19 47.5 +19.1	82.4	19 47.5 +19.1	82.4	19 47.5 +19.1	82.4	14
15	18 54.9 +11.3	79.0	19 06.2 +12.4	79.3	19 17.2 +13.4	79.6	19 27.8 +14.5	80.0	19 38.0 +15.6	80.3	19 47.9 +16.6	80.7	19 57.4 +17.7	81.1	20 06.6 +18.7	81.4	20 06.6 +18.7	81.4	20 06.6 +18.7	81.4	20 06.6 +18.7	81.4	20 06.6 +18.7	81.4	15
16	19 06.2 +11.0	77.9	19 18.6 +12.0	78.3	19 30.6 +13.1	78.6	19 42.3 +14.1	79.0	19 53.6 +15.2	79.3	20 04.5 +16.3	79.7	20 15.1 +17.3	80.0	20 25.3 +18.4	80.4	20 25.3 +18.4	80.4	20 25.3 +18.4	80.4	20 25.3 +18.4	80.4	20 25.3 +18.4	80.4	16
17	19 17.2 +10.6	76.9	19 30.6 +11.7	77.2	19 43.7 +12.7	77.6	19 56.4 +13.8	77.9	20 08.8 +14.8	78.3	20 20.8 +15.9	78.6	20 32.4 +17.0	79.0	20 43.7 +18.0	79.4	20 43.7 +18.0	79.4	20 43.7 +18.0	79.4	20 43.7 +18.0	79.4	20 43.7 +18.0	79.4	17
18	19 27.8 +10.2	75.8	19 42.3 +11.3	76.2	19 56.4 +12.4	76.5	20 10.2 +13.4	76.9	20 23.6 +14.5	77.3	20 36.7 +15.5	77.6	20 49.4 +16.5	78.0	21 01.7 +17.6	78.4	21 01.7 +17.6	78.4	21 01.7 +17.6	78.4	21 01.7 +17.6	78.4	21 01.7 +17.6	78.4	18
19	19 38.0 +9.9	74.8	19 53.6 +10.9	75.1	20 08.8 +12.0	75.5	20 23.6 +13.1	75.9	20 38.1 +14.1	76.2	20 52.2 +15.2	76.6	21 05.9 +16.3	77.0	21 19.3 +17.3	77.3	21 19.3 +17.3	77.3	21 19.3 +17.3	77.3	21 19.3 +17.3	77.3	21 19.3 +17.3	77.3	19
20	19 47.9 +9.5	73.7	20 04.5 +10.6	74.1	20 20.8 +11.6	74.5	20 36.7 +12.7	74.8	20 52.2 +13.7	75.2	21 07.4 +14.8	75.5	21 22.2 +15.8	75.9	21 36.6 +16.8	76.3	21 36.6 +16.8	76.3	21 36.6 +16.8	76.3	21 36.6 +16.8	76.3	21 36.6 +16.8	76.3	20
21	19 57.4 +9.2	72.7	20 15.1 +10.2	73.0	20 32.4 +11.3	73.4	20 49.4 +12.3	73.8	21 05.9 +13.4	74.1	21 22.2 +14.4	74.5	21 38.0 +15.4	74.9	21 53.4 +16.5	75.3	21 53.4 +16.5	75.3	21 53.4 +16.5	75.3	21 53.4 +16.5	75.3	21 53.4 +16.5	75.3	21
22	20 06.6 +8.7	71.6	20 25.3 +9.8	72.0	20 43.7 +10.8	72.4	21 01.7 +11.9	72.7	21 19.3 +13.0	73.1	21 36.6 +14.0	73.5	21 53.4 +15.1	73.8	22 09.9 +16.1	74.2	22 09.9 +16.1	74.2	22 09.9 +16.1	74.2	22 09.9 +16.1	74.2	22 09.9 +16.1	74.2	22
23	20 15.3 +8.4	70.6	20 35.1 +9.4	70.9	20 54.5 +10.5	71.3	21 13.6 +11.5	71.7	21 32.3 +12.5	72.0	21 50.6 +13.6	72.4	22 08.5 +14.7	72.8	22 26.0 +15.7	73.2	22 26.0 +15.7	73.2	22 26.0 +15.7	73.2	22 26.0 +15.7	73.2	22 26.0 +15.7	73.2	23
24	20 23.7 +8.0	69.5	20 44.5 +9.1	69.9	21 42.9 +8.5	66.0	22 07.2 +9.5	66.4	22 31.0 +10.5	66.7	22 54.5 +11.6	67.1	23 17.7 +12.5	67.5	23 40.4 +13.6	67.9	23 40.4 +13.6	67.9	23 40.4 +13.6	67.9	23 40.4 +13.6	67.9	23 40.4 +13.6	67.9	23
25	20 31.7 +7.7	68.5	20 53.6 +8.6	68.8	21 15.1 +9.7	69.2	21 36.2 +10.7	69.6	21 57.0 +11.7	69.9	22 17.4 +12.8	70.3	22 37.4 +13.8	70.7	22 57.0 +14.9	71.1	22 57.0 +14.9	71.1	22 57.0 +14.9	71.1	22 57.0 +14.9	71.1	22 57.0 +14.9	71.1	25
26	20 39.4 +7.2	67.4	21 02.2 +8.3	67.8	21 24.8 +9.3	68.1	21 46.9 +10.4	68.5	22 08.7 +11.4	68.9	22 30.2 +12.4	69.3	22 51.2 +13.5	69.6	23 11.9 +14.5	70.0	23 11.9 +14.5	70.0	23 11.9 +14.5	70.0	23 11.9 +14.5	70.0	23 11.9 +14.5	70.0	26
27	20 46.6 +6.9	66.4	21 10.5 +7.9	66.7	21 34.1 +8.8	67.1	21 57.3 +9.9	67.4	22 20.1 +10.9	67.8	22 42.6 +11.9	68.2	23 04.7 +13.0	68.5	23 04.7 +13.0	68.5	23 04.7 +13.0	68.5	23 04.7 +13.0	68.5	23 04.7 +13.0	68.5	23 04.7 +13.0	68.5	27
28	20 53.5 +6.4	65.3	21 18.4 +7.4	65.6	21 42.9 +8.5	66.0	22 07.2 +9.5	66.4	22 31.0 +10.5	66.7	22 54.5 +11.6	67.1	23 17.7 +12.5	67.5	23 40.4 +13.6	67.9	23 40.4 +13.6	67.9	23 40.4 +13.6	67.9	23 40.4 +13.6	67.9	23 40.4 +13.6	67.9	28
29	20 59.9 +6.1	64.2	21 25.8 +7.1	64.6	21 51.4 +8.1	64.9	22 16.7 +9.0	65.3	22 41.5 +10.1	65.7	23 21.2 +11.1	66.0	23 45												

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 74°, 286°

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	
0	15 26.5 -16.3	94.2	15 21.9 -17.3	94.5	15 17.0 -18.3	94.8	15 11.8 -19.3	95.1	15 06.4 -20.3	95.3	15 00.7 -21.4	95.6	14 54.7 -22.4	95.9	14 48.4 -23.3	96.1	14 42.7 -24.4	100.9	12 49.4 -24.4	100.9	12 49.4 -23.3	100.6	12 49.4 -24.4	100.9	5
1	15 10.2 -16.5	95.2	15 04.6 -17.5	95.5	14 58.7 -18.6	95.8	14 52.5 -19.6	96.0	14 46.1 -20.6	96.3	14 39.3 -21.6	96.6	14 32.3 -22.6	96.8	14 25.1 -23.6	97.1	14 25.1 -23.6	97.1	14 32.3 -22.6	96.8	14 25.1 -23.6	97.1	14 32.3 -22.6	96.8	1
2	14 53.7 -16.8	96.2	14 47.1 -17.8	96.5	14 40.1 -18.8	96.8	14 32.9 -19.8	97.0	14 25.5 -20.9	97.3	14 17.7 -21.8	97.5	14 09.7 -22.8	97.8	14 01.5 -23.8	98.0	14 01.5 -23.8	98.0	14 09.7 -22.8	97.8	14 01.5 -23.8	98.0	2		
3	14 36.9 -17.0	97.2	14 29.3 -18.1	97.5	14 21.3 -19.1	97.7	14 13.1 -20.1	98.0	14 04.6 -21.1	98.2	13 55.9 -22.1	98.5	13 46.9 -23.1	98.7	13 37.7 -24.1	99.0	13 37.7 -24.1	99.0	13 46.9 -23.1	98.7	13 37.7 -24.1	99.0	3		
4	14 19.9 -17.2	98.2	14 11.2 -18.3	98.5	14 02.2 -19.2	98.7	13 53.0 -20.3	99.0	13 43.5 -21.2	99.2	13 33.8 -22.3	99.4	13 23.8 -23.2	99.7	13 13.6 -24.2	99.9	13 13.6 -24.2	99.9	13 23.8 -23.2	99.7	13 13.6 -24.2	99.9	4		
5	14 02.7 -17.5	99.2	13 52.9 -18.5	99.5	13 43.0 -19.6	99.7	13 32.7 -20.5	99.9	13 22.3 -21.6	100.2	13 11.5 -22.5	100.4	13 00.6 -23.5	100.6	12 49.4 -24.4	100.9	12 49.4 -24.4	100.9	12 49.4 -24.4	100.9	12 49.4 -24.4	100.9	5		
6	13 45.2 -17.8	100.2	13 34.4 -18.7	100.4	13 23.4 -19.7	100.7	13 12.2 -20.7	100.9	13 00.7 -21.7	101.1	12 49.0 -22.7	101.4	12 37.1 -23.6	101.6	12 25.0 -24.7	101.8	12 25.0 -24.7	101.8	12 37.1 -23.6	101.6	12 25.0 -24.7	101.8	6		
7	13 27.4 -17.9	101.2	13 15.7 -19.0	101.4	13 03.7 -20.0	101.6	12 51.5 -21.0	101.9	12 39.0 -21.9	102.1	12 26.3 -22.8	102.3	12 13.5 -23.9	102.5	12 00.3 -24.8	102.7	12 00.3 -24.8	102.7	12 13.5 -23.9	102.5	12 00.3 -24.8	102.7	7		
8	13 09.5 -18.2	102.2	12 56.7 -19.2	102.4	12 43.7 -20.1	102.6	12 30.5 -21.1	102.8	12 17.1 -22.1	103.0	12 03.5 -23.1	103.2	11 49.6 -24.0	103.5	11 35.5 -25.0	103.7	11 35.5 -25.0	103.7	11 49.6 -24.0	103.5	11 35.5 -25.0	103.7	8		
9	12 51.3 -18.4	103.1	12 37.5 -19.4	103.4	12 23.6 -20.4	103.6	12 09.4 -21.4	103.8	11 55.0 -22.3	104.0	11 40.4 -23.3	104.2	11 25.6 -24.3	104.4	11 10.5 -25.1	104.6	11 10.5 -25.1	104.6	11 25.6 -24.3	104.4	11 10.5 -25.1	104.6	9		
10	12 32.9 -18.6	104.1	12 18.1 -19.6	104.3	12 03.2 -20.6	104.5	11 48.0 -21.5	104.7	11 32.7 -22.5	104.9	11 17.1 -23.5	105.1	11 01.3 -24.4	105.3	10 45.4 -25.3	105.5	10 45.4 -25.3	105.5	10 45.4 -25.3	105.5	10 45.4 -25.3	105.5	10		
11	12 14.3 -18.9	105.1	11 58.5 -19.8	105.3	11 42.6 -20.7	105.5	11 26.5 -21.7	105.7	11 10.2 -22.7	105.9	10 53.6 -23.6	106.1	10 36.9 -24.5	106.3	10 20.1 -25.5	106.4	10 20.1 -25.5	106.4	10 20.1 -25.5	106.4	10 20.1 -25.5	106.4	11		
12	11 55.4 -19.0	106.1	11 38.7 -19.9	106.3	11 21.9 -21.0	106.5	11 04.8 -21.9	106.6	10 47.5 -22.9	106.8	10 30.0 -23.8	107.0	10 12.4 -24.7	107.2	9 54.6 -25.6	107.4	9 54.6 -25.6	107.4	9 54.6 -25.6	107.4	9 54.6 -25.6	107.4	12		
13	11 36.4 -19.2	107.0	11 18.8 -20.2	107.2	11 00.9 -21.1	107.4	10 42.9 -22.1	107.6	10 24.6 -23.0	107.8	10 06.2 -23.9	107.9	9 47.7 -24.9	108.1	9 29.0 -25.8	108.3	9 29.0 -25.8	108.3	9 29.0 -25.8	108.3	9 29.0 -25.8	108.3	13		
14	11 17.2 -19.4	108.0	10 58.6 -20.4	108.2	10 39.8 -21.3	108.4	10 20.8 -22.2	108.5	10 01.6 -23.1	108.7	9 42.3 -24.1	108.9	9 22.8 -25.0	109.0	9 03.2 -25.9	109.2	9 03.2 -25.9	109.2	9 03.2 -25.9	109.2	9 03.2 -25.9	109.2	14		
15	10 57.8 -19.6	109.0	10 38.2 -20.5	109.1	10 18.5 -21.5	109.3	9 58.6 -22.4	109.5	9 38.5 -23.4	109.6	9 18.2 -24.2	109.8	8 57.8 -25.1	110.0	8 37.3 -26.1	110.1	8 37.3 -26.1	110.1	8 37.3 -26.1	110.1	8 37.3 -26.1	110.1	15		
16	10 38.2 -19.7	109.9	10 17.7 -20.7	110.1	9 57.0 -21.6	110.3	9 36.2 -22.6	110.4	9 15.1 -23.4	110.6	8 54.0 -24.4	110.7	8 32.7 -25.3	110.9	8 11.2 -26.1	111.0	8 11.2 -26.1	111.0	8 11.2 -26.1	111.0	8 11.2 -26.1	111.0	16		
17	10 18.5 -19.9	110.9	9 57.0 -20.8	111.0	9 35.4 -21.8	111.2	9 13.6 -22.7	111.4	8 51.7 -23.6	111.5	8 29.6 -24.5	111.7	8 07.4 -25.4	111.8	7 45.1 -26.3	111.9	7 45.1 -26.3	111.9	7 45.1 -26.3	111.9	7 45.1 -26.3	111.9	17		
18	9 58.6 -20.1	111.8	9 36.2 -21.1	112.0	9 13.6 -21.9	112.2	8 50.9 -22.8	112.3	8 28.1 -23.7	112.4	8 05.1 -24.6	112.6	7 42.0 -25.5	112.7	7 18.8 -26.4	112.8	7 18.8 -26.4	112.8	7 18.8 -26.4	112.8	7 18.8 -26.4	112.8	18		
19	9 38.5 -20.3	112.8	9 15.1 -21.1	112.9	8 51.7 -22.1	113.1	8 28.1 -23.0	113.2	8 04.4 -23.9	113.4	7 40.5 -24.7	113.5	7 16.5 -25.6	113.6	6 52.4 -26.5	113.7	6 52.4 -26.5	113.7	6 52.4 -26.5	113.7	6 52.4 -26.5	113.7	19		
20	9 18.2 -20.4	113.7	8 54.0 -21.3	113.9	8 29.6 -22.2	114.0	8 05.1 -23.1	114.2	7 40.5 -24.0	114.3	7 15.8 -24.9	114.4	6 50.9 -25.7	114.5	6 25.9 -26.5	114.6	6 25.9 -26.5	114.6	6 25.9 -26.5	114.6	6 25.9 -26.5	114.6	20		
21	8 57.8 -20.5	114.7	8 32.7 -21.5	114.8	8 07.4 -22.3	115.0	7 42.0 -23.2	115.1	7 16.5 -24.1	115.2	6 50.9 -25.0	115.3	6 25.2 -25.8	115.4	5 59.4 -26.7	115.5	5 59.4 -26.7	115.5	5 59.4 -26.7	115.5	5 59.4 -26.7	115.5	21		
22	8 37.3 -20.7	115.7	8 11.2 -21.5	115.8	7 45.1 -22.5	115.9	7 18.8 -23.3	116.0	6 52.4 -24.2	116.1	6 25.9 -25.0	116.2	5 59.4 -25.9	116.3	5 32.7 -26.8	116.4	5 32.7 -26.8	116.4	5 32.7 -26.8	116.4	5 32.7 -26.8	116.4	22		
23	8 16.6 -20.8	116.6	7 49.7 -21.7	116.7	7 22.6 -22.5	116.8	6 55.5 -23.5	117.0	6 28.2 -24.3	117.1	6 00.9 -25.2	117.2	5 33.5 -26.0	117.2	5 05.9 -26.8	117.3	5 05.9 -26.8	117.3	5 05.9 -26.8	117.3	5 05.9 -26.8	117.3	23		
24	7 55.8 -21.0	117.5	7 28.0 -21.8	117.7	7 00.1 -22.7	117.8	6 32.0 -23.5	117.9	6 03.9 -24.3	118.0	5 35.7 -25.2	118.1	5 07.5 -26.1	118.2	4 39.1 -26.9	118.2	4 39.1 -26.9	118.2	4 39.1 -26.9	118.2	4 39.1 -26.9	118.2	24		
25	7 34.8 -21.0	118.5	7 06.2 -22.0	118.6	6 37.4 -22.8	118.7	6 08.5 -23.6	118.8	5 39.6 -24.5	118.9	5 10.5 -25.3	119.0	4 41.4 -26.1	119.1	4 12.2 -26.9	119.1	4 12.2 -26.9	119.1	4 12.2 -26.9	119.1	4 12.2 -26.9	119.1	25		
26	7 13.8 -21.2	119.4	6 44.2 -22.0	119.5	6 14.6 -22.9	119.6	5 44.9 -23.7	119.7	5 15.1 -24.6	119.8	4 45.2 -25.4	119.9	4 15.3 -26.2	120.0	3 45.3 -27.0	120.0	3 45.3 -27.0	120.0	3 45.3 -27.0	120.0	3 45.3 -27.0	120.0	26		
27	6 52.6 -21.3	120.2	6 22.2 -22.0	120.4	5 51.7 -23.0	120.6	5 21.2 -23.9	120.7	4 50.5 -24.6	120.7	4 19.8 -25.4	120.8	3 49.1 -26.3	120.9	3 18.3 -27.1	120.9	3 18.3 -27.1	120.9	3 18.3 -27.1	120.9	3 18.3 -27.1	120.9	27		
28	6 31.3 -21.4	121.3	6 00.0 -22.2	121.4	5 28.7 -23.0	121.5	4 57.3 -24.2	121.6	4 25.9 -25.1	121.7	3 54.4 -25.5	121.8	2 32.8 -26.3	121.8	2 21.2 -27.1	121.8	2 21.2 -27.1	121.8	2 21.2 -27.1	121.8	2 21.2 -27.1	121.8	28		
29	6 09.9 -22.1	122.3	1 51.6 -22.9	131.6	1 11.7 -23.6	131.7	0 31.8 -24.3	131.7	0 0.81 +25.0	48.3	0 13.0 -25.1	130.8	0 0.81 +25.0	48.3	0 48.0 +25.7	48.3	1 27.8 -26.5	48.4	1 27.8 -26.5	48.4	1 27.8 -26.5	48.4	39		
30	5 48.4 -21.6	123.2	5 15.5 -22.4	123.3	4 42.5 -23.2	123.4	4 09.5 -24.0	123.4	3 36.4 -24.8	123.5	3 03.3 -25.6	123.5	2 30.2 -26.4	123.6	1 57.0 -27.2	123.6	1 57.0 -27.2	123.6	1 57.0 -27.2	123.6	1 57.0 -27.2	123.6	30		
31	5 26.8 -21.7	124.1	4 53.1 -22.5	124.2	4 19.3 -23.3	124.3	3 45.5 -24.1	124.3	3 11.6 -24.8	124.4	2 37.7 -25.6	124.4	2 03.8 -26.4	124.5	1 29.8 -										

75°, 285° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180°Zn=7
L.H.A. less than 180°Zn=360°-Z

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.
	Hc	d	Z																						
0	14 28.7	+15.9	94.0	14 24.4	+16.9	94.2	14 19.8	+18.0	94.5	14 15.0	+19.0	94.7	14 09.9	+20.0	95.0	14 04.6	+21.0	95.2	13 59.0	+22.0	95.5	13 53.1	+23.0	95.7	0
1	14 44.6	+15.6	93.0	14 41.3	+16.7	93.2	14 37.8	+17.7	93.5	14 34.0	+18.8	93.8	14 29.9	+19.8	94.0	14 25.6	+20.8	94.3	14 21.0	+21.8	94.5	14 16.1	+22.9	94.8	1
2	15 00.2	+15.4	92.0	14 58.0	+16.5	92.2	14 55.5	+17.5	92.5	14 52.8	+18.5	92.8	14 49.7	+19.6	93.0	14 46.4	+20.6	93.3	14 42.8	+21.6	93.6	14 39.0	+22.5	93.8	2
3	15 15.6	+15.1	91.0	15 14.5	+16.1	91.2	15 13.0	+17.2	91.5	15 11.3	+18.2	91.8	15 09.3	+19.3	92.1	15 07.0	+20.3	92.3	15 04.4	+21.3	92.6	15 01.5	+22.4	92.9	3
4	15 30.7	+14.9	90.0	15 30.6	+15.9	90.2	15 30.2	+17.0	90.5	15 29.5	+18.0	90.8	15 28.6	+19.0	91.1	15 27.3	+20.0	91.4	15 25.7	+21.1	91.6	15 23.9	+22.1	91.9	4
5	15 45.6	+14.6	89.0	15 46.5	+15.7	89.2	15 47.2	+16.7	89.5	15 47.5	+17.7	89.8	15 47.6	+18.7	90.1	15 47.3	+19.8	90.4	15 46.8	+20.8	90.7	15 46.0	+21.8	90.9	5
6	16 00.2	+14.3	88.0	16 02.2	+15.3	88.2	16 03.9	+16.4	88.5	16 05.2	+17.5	88.8	16 06.3	+18.5	89.1	16 07.1	+19.5	89.4	16 07.6	+20.6	89.7	16 07.8	+21.6	90.0	6
7	16 14.5	+14.0	86.9	16 17.5	+15.1	87.2	16 20.3	+16.1	87.5	16 22.7	+17.2	87.8	16 24.8	+18.2	88.1	16 26.6	+19.3	88.4	16 28.2	+20.2	88.7	16 29.4	+21.3	89.0	7
8	16 28.5	+13.7	85.9	16 32.6	+14.7	86.2	16 36.4	+15.8	86.5	16 39.9	+16.8	86.8	16 43.0	+17.9	87.1	16 45.9	+18.9	87.4	16 48.4	+20.0	87.7	16 50.7	+21.0	88.0	8
9	16 42.2	+13.4	84.9	16 47.3	+14.5	85.2	16 52.2	+15.5	85.5	16 56.7	+16.6	85.8	17 00.9	+17.7	86.1	17 04.8	+18.7	86.4	17 08.4	+19.7	86.7	17 11.7	+20.7	87.0	9
10	16 55.6	+13.1	83.9	17 01.8	+14.2	84.2	17 07.7	+15.3	84.5	17 13.3	+16.3	84.8	17 18.6	+17.3	85.1	17 23.5	+18.4	85.4	17 28.1	+19.4	85.7	17 32.4	+20.5	86.1	10
11	17 08.7	+12.8	82.9	17 16.0	+13.9	83.2	17 23.0	+14.9	83.5	17 29.6	+16.0	83.8	17 35.9	+17.0	84.1	17 41.9	+18.1	84.4	17 47.5	+19.2	84.8	17 52.9	+20.1	85.1	11
12	17 21.5	+12.5	81.9	17 29.9	+13.5	82.2	17 37.9	+14.6	82.5	17 45.6	+15.6	82.8	17 52.9	+16.7	83.1	18 00.0	+17.7	83.4	18 06.7	+18.8	83.8	18 13.0	+19.8	84.1	12
13	17 34.0	+12.2	80.8	17 43.4	+13.2	81.1	17 52.5	+14.3	81.5	18 01.2	+15.4	81.8	18 09.6	+16.4	82.1	18 17.7	+17.5	82.4	18 25.5	+18.4	82.8	18 32.8	+19.6	83.1	13
14	17 46.2	+11.8	79.8	17 56.6	+12.9	80.1	18 06.8	+13.9	80.4	18 16.6	+15.0	80.8	18 26.0	+16.1	81.1	18 35.2	+17.1	81.4	18 43.9	+18.2	81.8	18 52.4	+19.2	82.1	14
15	17 58.0	+11.5	78.8	18 09.5	+12.6	79.1	18 20.7	+13.7	79.4	18 31.6	+14.7	79.7	18 42.1	+15.8	80.1	18 52.3	+16.8	80.4	19 02.1	+17.8	80.7	19 11.6	+18.9	81.1	15
16	18 09.5	+11.2	77.7	18 22.1	+12.3	78.1	18 34.4	+13.3	78.4	18 46.3	+14.3	78.7	18 57.9	+15.4	79.1	19 09.1	+16.4	79.4	19 19.9	+17.5	79.7	19 30.5	+18.5	80.1	16
17	18 20.7	+10.9	76.7	18 34.4	+11.9	77.0	18 47.7	+12.9	77.4	19 00.6	+14.1	77.7	19 13.3	+15.0	78.0	19 25.5	+16.1	78.4	19 37.4	+17.2	78.7	19 49.0	+18.2	79.1	17
18	18 31.6	+10.5	75.7	18 46.3	+11.6	76.0	19 00.6	+12.7	76.3	19 14.7	+13.6	76.7	19 28.3	+14.7	77.0	19 41.6	+15.8	77.3	19 54.6	+16.8	77.7	20 07.2	+17.9	78.1	18
19	18 42.1	+10.2	74.6	18 57.9	+11.2	75.0	19 13.3	+12.2	75.3	19 28.3	+13.3	75.6	19 43.0	+14.4	76.0	19 57.4	+15.4	76.3	20 11.4	+16.5	76.7	20 25.1	+17.4	77.0	19
20	18 52.3	+9.8	73.6	19 09.1	+10.8	73.9	19 25.5	+11.9	74.3	19 41.6	+13.0	74.6	19 57.4	+14.0	74.9	20 12.8	+15.1	75.3	20 27.9	+16.1	75.7	20 42.5	+17.2	76.0	20
21	19 02.1	+9.5	72.5	19 19.9	+10.6	72.9	19 37.4	+11.6	73.2	19 54.6	+12.6	73.6	20 11.4	+13.7	73.9	20 27.9	+14.6	74.3	20 44.0	+15.7	74.6	20 59.7	+16.7	75.0	21
22	19 11.6	+9.1	71.5	19 30.5	+10.1	71.8	19 49.0	+11.2	72.2	20 07.2	+12.2	72.5	20 25.1	+13.2	72.9	20 42.5	+14.4	73.2	20 59.7	+15.3	73.6	21 16.4	+16.4	74.0	22
23	19 20.7	+8.8	70.4	19 40.6	+9.8	70.8	20 00.2	+10.8	71.1	20 19.4	+11.9	71.5	20 38.3	+12.9	71.8	20 56.9	+13.9	72.2	21 15.0	+15.0	72.6	21 32.8	+16.0	72.9	23
24	19 29.5	+8.4	69.4	19 50.4	+9.4	69.7	20 11.0	+10.5	70.1	20 31.3	+11.5	70.4	20 51.2	+12.5	70.8	21 10.8	+13.5	71.1	21 30.0	+14.6	71.5	21 48.8	+15.6	71.9	24
25	19 37.9	+8.0	68.3	19 59.8	+9.1	68.7	20 21.5	+10.0	69.0	20 42.8	+11.1	69.4	21 03.7	+12.2	69.7	21 24.3	+13.2	70.1	21 44.6	+14.2	70.5	22 04.4	+15.3	70.9	25
26	19 45.9	+7.6	67.3	20 08.9	+8.6	67.6	20 31.5	+9.7	68.0	20 53.9	+10.7	68.3	21 15.9	+11.7	68.7	21 37.5	+12.8	69.1	21 58.8	+13.7	69.4	22 19.7	+14.8	69.8	26
27	19 53.5	+7.3	66.2	20 17.5	+8.3	66.6	20 41.2	+9.3	66.9	21 04.6	+10.3	67.3	21 27.6	+11.3	67.6	21 50.3	+12.3	68.0	22 12.5	+13.4	68.4	22 34.5	+14.4	68.8	27
28	20 00.8	+6.9	65.2	20 25.8	+8.0	65.5	20 50.5	+9.0	65.9	21 14.9	+9.9	66.2	21 38.9	+11.0	66.6	22 02.6	+12.0	66.9	22 25.9	+13.0	67.3	22 48.9	+14.0	67.7	28
29	20 07.7	+6.6	64.1	20 33.8	+7.5	64.5	20 59.5	+8.5	64.8	21 24.8	+9.6	65.2	21 49.9	+10.5	65.5	22 14.6	+11.5	65.9	22 38.9	+12.5	66.3	23 02.9	+13.5	66.7	29
30	20 14.3	+6.1	63.1	20 41.3	+7.1	63.4	21 08.0	+8.1	63.7	21 34.4	+9.1	64.1	22 00.4	+10.1	64.5	22 26.1	+11.1	64.8	22 51.4	+12.2	65.2	23 16.4	+13.2	65.6	30
31	20 20.4	+5.8	62.0	20 48.4	+6.8	62.3	21 16.1	+7.7	62.7	21 43.5	+8.7	63.0	22 10.5	+9.7	63.4	22 37.2	+10.7	63.8	23 03.6	+11.7	64.1	23 29.6	+12.7	64.5	31
32	20 26.2	+5.4	60.9	20 55.2	+6.3	61.3	21 23.8	+7.4	61.6	21 52.2	+8.3	62.5	22 20.2	+9.3	62.8	22 47.9	+10.3	63.2	23 15.3	+11.2	63.1	23 42.3	+12.2	63.5	32
33	20 31.6	+4.9	59.9	21 01.5	+6.0	60.2	21 31.2	+6.9	60.6	22 00.5	+7.9	60.9	22 29.5	+8.9	61.3	22 58.2	+9.9	61.6	23 26.5	+10.9	62.0	23 54.5	+11.9	62.4	33
34	20 36.5	+4.6	58.8	21 07.5	+5.5	59.1	21 38.1	+6.5	59.5	22 08.4	+7.5	59.8	22 38.4	+8.4	60.2	23 08.1	+9.4	60.6	23 37.4	+10.4	60.9	24 06.4	+11.3	61.3	34
35	20 41.1	+4.2	57.8	21 13.0	+5.2	58.1	21 44.6	+6.1	58.4	22 15.9	+7.0	58.8	22 46.8	+8.0	59.1	23 17.5	+8.9	59.5	23 47.8	+9.9	59.9	24 17.7	+10.9	60.2	35
36	20 45.3	+3.9	56.7	21 18.2	+4.7	57.0	21 50.7	+5.7	57.3	22 22.9	+6.6	57.7	22 54.8	+7.6	58.0	23 26.4	+8.6	58.4	23 57.7	+9.5	58.8	24 28.6	+10.5	59.2	36
37	20 49.2	+3.4	55.6	21 22.9	+4.3	55.9	21 56.4	+5.2	56.3	22 29.5	+6.2	56.6	23 02.4	+7.1	57.0	23 35.0	+8.0	57.3	24 07.2	+9.0	57.7	24 39.1	+10.0		

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 75° , 285°

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.
	Hc	d	Z																						
0	14 28.7	-16.2	94.0	14 24.4	-17.2	94.2	14 19.8	-18.2	94.5	14 15.0	-19.3	94.7	14 09.9	-20.3	95.0	14 04.6	-21.3	95.2	13 59.0	-22.3	95.5	13 53.1	-23.3	95.7	0
1	14 12.5	-16.4	95.0	14 07.2	-17.5	95.2	14 01.6	-18.5	95.5	13 55.7	-19.4	95.7	13 49.6	-20.4	96.0	13 43.3	-21.5	96.2	13 36.7	-22.5	96.4	13 29.8	-23.4	96.7	1
2	13 56.1	-16.7	96.0	13 49.7	-17.6	96.2	13 43.1	-18.7	96.4	13 36.3	-19.7	96.7	13 29.2	-20.8	96.9	13 21.8	-21.7	97.2	13 14.2	-22.7	97.4	13 06.4	-23.7	97.6	2
3	13 39.4	-16.9	96.9	13 32.1	-18.0	97.2	13 24.4	-18.9	97.4	13 16.6	-20.0	97.7	13 08.4	-20.9	97.9	13 00.1	-21.9	98.1	12 51.5	-22.9	98.3	12 42.7	-23.9	98.6	3
4	13 22.5	-17.1	97.9	13 14.1	-18.1	98.2	13 05.5	-19.1	98.4	12 56.6	-20.1	98.6	12 47.5	-21.1	98.8	12 38.2	-22.2	99.1	12 28.6	-23.1	99.3	12 18.8	-24.1	99.5	4
5	13 05.4	-17.3	98.9	12 56.0	-18.3	99.1	12 46.4	-19.4	99.4	12 36.5	-20.4	99.6	12 26.4	-21.4	99.8	12 16.0	-22.3	100.0	12 05.5	-23.3	100.2	11 54.7	-24.2	100.4	5
6	12 48.1	-17.6	99.9	12 37.7	-18.6	100.1	12 27.0	-19.5	100.3	12 16.1	-20.5	100.6	12 05.0	-21.5	100.8	11 53.7	-22.5	101.0	11 42.2	-23.5	101.2	11 30.5	-24.5	101.4	6
7	12 30.5	-17.7	100.9	12 19.1	-18.8	101.1	12 07.5	-19.8	101.3	11 55.6	-20.8	101.5	11 43.5	-21.7	101.7	11 31.2	-22.7	101.9	11 18.7	-23.6	102.1	11 06.0	-24.6	102.3	7
8	12 12.8	-18.0	101.9	12 00.3	-18.2	102.1	11 47.7	-20.0	102.3	11 34.8	-20.9	102.5	11 21.8	-21.9	102.7	11 08.5	-22.8	102.9	10 55.1	-23.9	103.1	10 41.4	-24.7	103.2	8
9	11 54.8	-18.2	102.8	11 41.4	-19.2	103.0	11 27.7	-20.1	103.2	11 13.9	-21.1	103.4	10 59.9	-22.1	103.6	10 45.7	-23.1	103.8	10 31.2	-23.8	104.0	10 16.7	-25.0	104.2	9
10	11 36.6	-18.3	103.8	11 22.2	-19.3	104.0	11 07.6	-20.3	104.2	10 52.8	-21.3	104.4	10 37.8	-22.3	104.6	10 22.6	-23.2	104.7	10 07.3	-24.2	104.9	9 51.7	-25.1	105.1	10
11	11 18.3	-18.6	104.8	11 02.9	-19.6	105.0	10 47.3	-20.5	105.2	10 31.5	-21.5	105.3	10 15.5	-22.4	105.5	9 59.4	-23.3	105.7	9 43.1	-24.3	105.8	9 26.6	-25.2	106.0	11
12	10 59.7	-18.7	105.7	10 43.3	-19.7	105.9	10 26.8	-20.7	106.1	10 10.0	-21.6	106.3	9 53.1	-22.5	106.5	9 36.1	-23.6	106.6	9 18.8	-24.4	106.8	9 01.4	-25.3	106.9	12
13	10 41.0	-19.0	106.7	10 23.6	-19.9	106.9	10 06.1	-20.8	107.1	9 48.4	-21.8	107.2	9 30.6	-22.8	107.4	9 12.5	-23.6	107.5	8 54.4	-24.6	107.7	8 36.1	-25.5	107.8	13
14	10 22.0	-19.0	107.7	10 03.7	-20.0	107.8	9 45.5	-21.0	108.0	9 26.6	-21.9	108.2	9 07.8	-22.8	108.3	8 48.9	-23.8	108.5	8 29.8	-24.7	108.6	8 10.6	-25.6	108.8	14
15	10 03.0	-19.3	108.6	9 43.7	-20.2	108.8	9 24.3	-21.2	109.0	9 04.7	-22.1	109.1	8 45.0	-23.0	109.3	8 25.1	-23.9	109.4	8 05.1	-24.8	109.5	7 45.0	-25.8	109.7	15
16	9 43.7	-19.4	109.6	9 23.5	-20.4	109.8	9 03.1	-21.3	109.9	8 42.6	-22.2	110.1	8 22.0	-23.2	110.2	8 01.2	-24.1	110.3	7 40.3	-25.0	110.5	7 19.2	-25.8	110.6	16
17	9 24.3	-19.6	110.6	9 03.1	-20.5	110.7	8 41.8	-21.4	110.9	8 20.4	-22.3	111.0	7 58.8	-23.2	111.1	7 37.1	-24.1	111.3	7 15.3	-25.0	111.4	6 53.4	-25.9	111.5	17
18	9 04.7	-19.7	111.5	8 42.6	-20.6	111.7	8 20.4	-21.6	111.8	7 58.1	-22.5	111.9	7 35.6	-23.4	112.1	7 13.0	-24.3	112.2	6 50.3	-25.2	112.3	6 27.5	-26.1	112.4	18
19	8 45.0	-19.9	112.5	8 22.0	-20.8	112.6	7 58.8	-21.7	112.7	7 35.6	-22.6	112.9	7 12.2	-23.5	113.0	6 48.7	-24.4	113.1	6 25.1	-25.2	113.2	6 01.4	-26.1	113.3	19
20	8 25.1	-20.0	113.4	8 01.2	-20.9	113.6	7 37.1	-21.8	113.7	7 13.0	-22.7	113.8	6 48.7	-23.6	113.9	6 24.3	-24.4	114.0	5 59.9	-25.4	114.1	5 35.3	-26.2	114.2	20
21	8 05.1	-20.1	114.4	7 40.3	-21.1	114.5	7 15.3	-21.9	114.6	6 50.3	-22.8	114.7	6 25.1	-23.7	114.8	5 59.9	-24.6	114.9	5 34.5	-25.4	115.0	5 09.1	-26.3	115.1	21
22	7 45.0	-20.3	115.3	7 19.2	-21.1	115.5	6 53.4	-22.0	115.6	6 27.5	-23.0	115.7	6 01.4	-23.8	115.8	5 35.3	-24.7	115.9	5 09.1	-25.5	116.0	4 42.8	-26.4	116.0	22
23	7 24.7	-20.4	116.3	6 58.1	-21.3	116.4	6 31.4	-22.2	116.5	6 04.5	-23.0	116.6	5 37.6	-23.8	116.7	5 10.6	-24.7	116.8	4 43.6	-25.6	116.9	4 16.4	-26.4	116.9	23
24	7 04.3	-20.5	117.2	6 36.8	-21.4	117.3	6 09.2	-22.2	117.4	5 41.5	-23.1	117.5	5 13.8	-24.0	117.6	4 45.9	-24.8	117.7	4 18.0	-25.6	117.8	3 50.0	-26.5	117.8	24
25	6 43.8	-20.6	118.2	6 15.4	-21.4	118.3	5 47.0	-22.4	118.4	5 18.4	-23.2	118.5	4 49.8	-24.0	118.6	4 21.1	-24.9	118.7	3 52.4	-25.7	118.7	3 23.5	-26.5	118.7	25
26	6 23.2	-20.7	119.1	5 54.0	-21.6	119.2	5 24.6	-22.4	119.3	4 55.2	-23.2	119.4	4 25.8	-24.1	119.5	3 56.2	-25.4	119.6	2 57.0	-26.6	119.6	2 26.0	-27.4	119.6	26
27	6 02.5	-20.8	120.1	5 32.4	-21.7	120.2	5 02.2	-22.5	120.2	4 32.0	-23.4	120.3	4 01.7	-24.2	120.4	3 31.3	-25.0	120.4	3 00.9	-25.8	120.5	2 30.4	-26.6	120.5	27
28	5 41.7	-20.9	121.0	5 10.7	-21.7	121.1	4 39.7	-22.5	121.2	4 08.6	-23.4	121.2	3 37.5	-24.2	121.3	3 06.3	-25.0	121.3	2 35.1	-25.8	121.4	2 03.8	-26.6	121.4	28
29	5 20.8	-21.0	122.0	4 49.0	-21.8	122.0	4 17.2	-22.7	122.1	3 45.2	-23.6	122.2	2 41.3	-25.1	122.2	2 09.3	-25.2	122.3	1 37.2	-26.7	122.3	1 37.2	-26.7	122.3	29
30	4 59.8	-21.1	122.9	4 27.2	-21.9	123.0	3 54.5	-22.7	123.0	3 21.8	-23.5	123.1	2 49.0	-24.3	123.1	2 16.2	-25.1	123.2	1 43.4	-25.9	123.2	1 0.5	-26.6	123.2	30
31	4 38.7	-21.1	123.8	4 05.3	-22.0	123.9	3 31.8	-22.7	123.9	2 58.3	-23.3	124.0	2 24.7	-24.3	124.0	1 51.1	-25.1	124.1	1 17.5	-25.4	124.1	0 43.9	-26.7	124.1	31
32	4 17.6	-21.2	124.8	3 43.3	-22.0	124.9	3 09.1	-22.8	124.9	2 34.7	-23.6	124.9	2 00.4	-24.4	124.9	1 26.0	-25.2	125.0	0 51.6	-25.9	125.0	0 17.2	-26.7	125.0	32
33	3 56.4	-21.3	125.7	3 21.3	-22.0	125.8	2 46.3	-22.9	125.8	2 11.1	-23.6	125.8	1 36.0	-24.4	125.9	1 00.8	-25.1	125.9	0 25.7	-26.0	125.9	0 0.9	+26.7	125.9	33
34	3 35.1	-21.3	126.6	2 59.3	-22.1	126.7	2 00.5	-22.9	127.7	1 23.9	-23.7	127.7	0 47.2	-24.5	127.7	0 10.5	-25.2	127.7	0 26.2	+25.9	128.3	1 02.9	+26.7	128.3	34
35	3 13.8	-21.4	127.6	2 37.2	-22.2	127.6	2 00.5	-22.9	127.7	1 23.9	-23.7	127.7	0 47.2	-24.5	127.7	0 14.7	+2.5	127.7	0 52.1	+25.9	127.7	1 29.6	+26.6	127.7	35
36	2 52.4	-21.4	128.5	2 15.0	-22.2	128.6	1 37.6	-22.9	128.6	0 0.2	-23.7	128.6	0 22.7	-24.4	128.6	0 10.4	+2.5	128.6	0 52.1	+25.9	128.6	1 29.6	+26.6	128.6	36
37	2 31.0	-21.5	129.5	1 51.8	-22.2	129.5	0 36.5	-23.7	129.5	0 17.7	-24.7	129.5	0 0.7	+24.4	129.5	0 18									

76°, 284° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180°Zn=7
L.H.A. less than 180°Zn=360°-Z

	15°			16°			17°			18°			19°			20°			21°			22°			
Dec.	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Dec.
0	13 30.8 +15.9	93.7	13 26.8 +16.9	93.9	13 22.6 +17.9	94.2	13 18.1 +19.0	94.4	13 13.4 +19.9	94.6	13 08.4 +21.0	94.9	13 03.2 +22.0	95.1	12 57.7 +23.0	95.3	0	14 50.3 +21.9	90.6	15 08.0 +20.8	90.3	14 50.8 +20.8	90.3	14 50.3 +21.9	90.6
1	13 46.7 +15.6	92.7	13 43.7 +16.7	92.9	13 40.5 +17.7	93.2	13 37.1 +18.7	93.4	13 33.3 +19.8	93.7	13 29.4 +20.7	93.9	13 25.2 +21.7	94.1	13 20.7 +22.7	94.4	1	14 51.8 +19.2	84.4	16 45.8 +18.2	84.1	16 51.8 +19.2	84.4	16 57.5 +20.2	84.7
2	14 02.3 +15.4	91.7	14 00.4 +16.4	92.0	13 58.2 +17.4	92.2	13 55.8 +18.4	92.5	13 53.1 +19.5	92.7	13 50.1 +20.5	92.9	13 46.9 +21.5	93.2	13 43.4 +22.6	93.4	2	14 52.0 +19.3	84.6	16 48.7 +18.6	84.4	16 52.0 +19.3	84.6	16 59.1 +21.0	87.7
3	14 17.7 +15.1	90.7	14 16.8 +16.2	91.0	14 15.6 +17.2	91.2	14 14.2 +18.3	91.5	14 12.6 +19.2	91.7	14 10.6 +20.3	92.0	14 08.4 +21.3	92.2	14 06.0 +22.3	92.5	3	14 52.5 +20.0	87.4	15 49.6 +19.0	87.1	15 52.5 +20.0	87.4	15 55.1 +21.0	87.7
4	14 32.8 +14.8	89.7	14 33.0 +15.9	90.0	14 32.8 +17.0	90.2	14 32.5 +18.0	90.5	14 31.8 +19.0	90.7	14 30.9 +20.1	91.0	14 29.7 +21.1	91.3	14 28.3 +22.0	91.5	4	14 52.9 +21.1	91.3	14 50.3 +21.9	90.6	14 50.8 +20.8	90.3	14 50.3 +21.9	90.6
5	14 47.6 +14.7	88.7	14 48.9 +15.6	89.0	14 49.8 +16.7	89.2	14 50.5 +17.7	89.5	14 50.8 +18.8	89.8	14 51.0 +19.7	90.0	14 50.8 +20.8	90.3	14 50.8 +20.8	90.3	5	14 51.0 +19.7	90.0	15 48.0 +18.8	89.8	15 48.0 +18.8	89.8	15 48.0 +18.8	89.8
6	15 02.3 +14.3	87.7	15 04.5 +15.4	88.0	15 06.5 +16.4	88.2	15 08.2 +17.5	88.5	15 09.6 +18.5	88.8	15 10.7 +19.6	89.1	15 11.6 +20.6	89.3	15 12.2 +21.5	89.6	6	15 29.4 +20.7	93.9	13 25.2 +21.7	94.1	13 20.7 +22.7	94.4	13 20.7 +22.7	94.4
7	15 16.6 +14.1	86.7	15 19.9 +15.1	87.0	15 22.9 +16.2	87.2	15 25.7 +17.2	87.5	15 28.1 +18.3	87.8	15 30.3 +19.3	88.1	15 32.2 +20.3	88.4	15 33.7 +21.4	88.6	7	15 46.4 +18.0	86.8	15 49.6 +19.0	87.1	15 52.5 +20.0	87.4	15 55.1 +21.0	87.7
8	15 30.7 +13.8	85.7	15 35.0 +14.9	86.0	15 39.1 +15.9	86.2	15 42.9 +16.9	86.5	15 46.4 +18.0	86.8	15 49.6 +19.0	87.1	15 52.5 +20.0	87.4	15 55.1 +21.0	87.7	8	15 52.5 +20.0	87.4	15 55.1 +21.0	87.7	15 58.6 +22.0	86.7	15 58.6 +22.0	86.7
9	15 44.5 +13.5	84.7	15 49.9 +14.5	85.0	15 55.0 +15.6	85.2	15 59.8 +16.7	85.5	15 04.4 +17.7	85.8	15 08.6 +18.7	86.1	15 12.5 +19.8	86.4	15 16.1 +20.8	86.7	9	15 59.8 +16.7	85.5	15 58.6 +18.7	86.1	15 58.6 +18.7	86.1	15 58.6 +18.7	86.1
10	15 58.0 +13.2	83.7	16 04.4 +14.3	84.0	16 10.6 +15.4	84.2	16 16.5 +16.4	84.5	16 22.1 +17.4	84.8	16 27.3 +18.5	85.1	16 32.3 +19.5	85.4	16 36.9 +20.6	85.7	10	16 22.1 +17.4	84.8	16 27.3 +18.5	85.1	16 32.3 +19.5	85.4	16 36.9 +20.6	85.7
11	16 11.2 +13.0	82.7	16 18.7 +14.0	82.9	16 26.0 +15.0	83.2	16 32.9 +16.1	83.5	16 39.5 +17.1	83.8	16 45.8 +18.2	84.1	16 51.8 +19.2	84.4	16 57.5 +20.2	84.7	11	16 45.8 +18.2	84.1	16 51.8 +19.2	84.4	16 57.5 +20.2	84.7	16 57.5 +20.2	84.7
12	16 24.2 +12.6	81.6	16 32.7 +13.7	81.9	16 41.0 +14.8	82.2	16 49.0 +15.8	82.5	16 56.6 +16.9	82.8	17 04.0 +17.8	83.1	17 11.0 +18.9	83.4	17 17.7 +19.9	83.7	12	16 56.6 +16.9	82.5	17 04.0 +17.8	83.1	17 11.0 +18.9	83.4	17 17.7 +19.9	83.7
13	16 36.8 +12.3	80.6	16 46.4 +13.4	80.9	16 55.8 +14.4	81.2	17 04.8 +15.5	81.5	17 13.5 +16.5	81.8	17 21.8 +17.6	82.1	17 29.9 +18.6	82.4	17 37.6 +19.7	82.8	13	16 55.8 +14.4	81.2	17 04.8 +15.5	81.5	17 13.5 +16.5	81.8	17 21.8 +17.6	82.1
14	16 49.1 +12.1	79.6	16 59.8 +13.1	79.9	17 10.2 +14.2	80.2	17 20.3 +15.2	80.5	17 30.0 +16.3	80.8	17 39.4 +17.3	81.1	17 48.5 +18.3	81.4	17 57.3 +19.3	81.8	14	16 59.8 +13.1	79.9	17 10.2 +14.2	80.2	17 20.3 +15.2	80.5	17 30.0 +16.3	80.8
15	17 01.2 +11.7	78.6	17 12.9 +12.8	78.9	17 24.4 +13.8	79.2	17 35.5 +14.8	79.5	17 46.3 +15.9	79.8	17 56.7 +17.0	80.1	18 06.8 +18.1	80.4	18 16.6 +19.1	80.8	15	17 01.2 +11.7	78.6	17 12.9 +12.8	78.9	17 24.4 +13.8	79.2	17 35.5 +14.8	79.5
16	17 12.9 +11.5	77.5	17 25.7 +12.5	77.8	17 38.2 +13.5	78.2	17 50.3 +14.6	78.5	18 02.2 +15.6	78.8	18 13.7 +16.6	79.1	18 24.9 +17.6	79.4	18 35.7 +18.7	79.8	16	17 12.9 +11.5	77.5	17 25.7 +12.5	77.8	17 38.2 +13.5	78.2	18 02.2 +15.6	78.5
17	17 24.4 +11.1	76.5	17 38.2 +12.1	76.8	17 51.7 +13.2	77.1	18 04.9 +14.3	77.4	18 17.8 +15.3	77.8	18 30.3 +16.4	78.1	18 42.5 +17.4	78.4	18 54.4 +18.4	78.8	17	17 24.4 +11.1	76.5	17 38.2 +12.1	76.8	18 04.9 +14.3	77.4	18 17.8 +15.3	77.8
18	17 35.5 +10.8	75.5	17 50.3 +11.9	75.8	18 04.9 +12.9	76.1	18 19.2 +13.9	76.4	18 33.1 +14.9	76.8	18 46.7 +16.0	77.1	18 59.9 +17.0	77.4	19 12.8 +18.1	77.8	18	17 35.5 +10.8	75.5	17 50.3 +11.9	75.8	18 04.9 +12.9	76.1	18 19.2 +13.9	76.4
19	17 46.3 +10.4	74.5	18 02.2 +11.5	74.8	18 17.8 +12.5	75.1	18 33.1 +13.6	75.4	18 48.0 +14.7	75.7	19 02.7 +15.6	76.1	19 16.9 +16.7	76.4	19 30.9 +17.7	76.7	19	17 46.3 +10.4	74.5	18 02.2 +11.5	74.8	18 17.8 +12.5	75.1	18 33.1 +13.6	75.4
20	17 56.7 +10.1	73.4	18 13.7 +11.2	73.7	18 30.3 +12.2	74.0	18 46.7 +13.2	74.4	19 02.7 +14.2	74.7	19 18.3 +15.3	75.0	19 33.6 +16.4	75.4	19 48.6 +17.4	75.7	20	17 56.7 +10.1	73.4	18 13.7 +11.2	73.7	18 30.3 +12.2	74.0	18 46.7 +13.2	74.4
21	18 06.8 +9.8	72.4	18 24.9 +10.8	72.7	18 42.5 +11.9	73.0	18 59.9 +12.9	73.3	19 16.9 +14.0	73.7	19 33.6 +15.0	74.0	19 50.0 +16.0	74.4	20 06.0 +17.0	74.7	21	18 06.8 +9.8	72.4	18 24.9 +10.8	72.7	18 42.5 +11.9	73.0	18 59.9 +12.9	73.3
22	18 16.6 +9.5	71.3	18 35.7 +10.5	71.7	18 54.4 +11.5	72.0	19 12.8 +12.6	72.3	19 30.9 +13.6	72.6	19 48.6 +14.6	73.0	20 06.0 +15.6	73.3	20 23.0 +16.7	73.7	22	18 16.6 +9.5	71.3	18 35.7 +10.5	71.7	18 54.4 +11.5	72.0	19 12.8 +12.6	72.3
23	18 26.1 +9.1	70.3	18 46.2 +10.1	70.6	19 05.9 +11.2	70.9	19 25.4 +12.2	71.3	19 44.5 +13.2	71.6	20 03.2 +14.3	72.0	20 21.6 +15.3	72.3	20 39.7 +16.3	72.7	23	18 26.1 +9.1	70.3	18 46.2 +10.1	70.6	19 05.9 +11.2	70.9	19 25.4 +12.2	71.3
24	18 35.2 +8.8	69.3	18 56.3 +9.8	69.6	19 17.1 +10.8	69.9	19 37.6 +11.8	70.2	19 57.7 +12.8	70.6	20 17.5 +13.9	70.9	20 36.9 +14.9	71.3	20 56.0 +15.9	71.6	24	18 35.2 +8.8	69.3	18 56.3 +9.8	69.6	19 17.1 +10.8	69.9	19 37.6 +11.8	70.2
25	18 44.0 +8.4	68.2	19 06.1 +9.5	68.5	19 27.9 +10.5	68.8	19 49.4 +11.5	69.2	20 05.0 +12.5	69.5	20 31.4 +13.5	69.9	20 51.8 +14.6	70.2	21 11.9 +15.6	70.6	25	18 44.0 +8.4	68.2	19 06.1 +9.5	68.5	19 27.9 +10.5	68.8	19 49.4 +11.5	69.2
26	18 52.4 +8.1	67.2	19 15.6 +9.1	67.5	19 38.4 +10.1	67.8	20 00.9 +11.1	68.1	20 23.0 +12.2	68.5	20 44.9 +13.1	68.8	21 06.4 +14.1	69.2	21 27.5 +15.2	69.6	26	18 52.4 +8.1	67.2	19 15.6 +9.1	67.5	19 38.4 +10.1	67.8	20 00.9 +11.1	68.1
27	19 00.5 +7.7	66.1	19 24.7 +8.7	66.4	19 48.5 +9.7	66.8	20 12.0 +10.7	67.1	20 35.2 +11.7	67.4	20 58.0 +12.8	67.8	21 20.5 +13.8	68.2	21 42.7 +14.7	68.5	27	19 00.5 +7.7	66.1	19 24.7 +8.7	66.4	19 48.5 +9.7	66.8	20 12.0 +10.7	67.1
28	19 08.2 +7.4	65.1	19 23.4 +8.3	65.4	19 45.9 +7.8	65.7	20 22.7 +10.4	66.1	20 46.9 +11.4	66.4	21 10.8 +12.3	66.7	21 34.3 +13.4	67.1	21 57.4 +14.4	67.5	28	19 08.2 +7.4	65.1	19 23.4 +8.3	65.4	19 45.9 +7.8	65.7	20 22.7 +10.4	66.1
29	19 15.6 +7.0	64.0	20 07.6 +8.0	64.3	20 33.1 +9.0	64.7	21 49.1 +9.0	65.0	22 33.1 +10.0	65.0	20 58.3 +11.0	65.3	21 23.1 +12.0	65.7	21 47.7 +12.9										

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 76°, 284°

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.				
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z					
0	13 30.8 -16.1	93.7	13 26.8 -17.1	93.9	13 22.6 -18.1	94.2	13 18.1 -19.2	94.4	13 13.4 -20.2	94.6	13 08.4 -21.2	94.9	13 03.2 -22.2	95.1	12 57.7 -23.1	95.3	12 00.0 -24.1	100.0	11 10.3 -23.1	99.8	11 00.0 -24.1	100.0	11 10.3 -23.1	99.8	11 00.0 -24.1	100.0	5		
1	13 14.7 -16.3	94.7	13 09.7 -17.3	94.9	13 04.5 -18.4	95.1	12 58.9 -19.3	95.4	12 53.2 -20.4	95.6	12 47.2 -21.4	95.8	12 41.0 -22.4	96.1	12 34.6 -23.4	96.3	12 00.0 -24.1	100.0	11 10.3 -23.1	99.8	11 00.0 -24.1	100.0	11 10.3 -23.1	99.8	11 00.0 -24.1	100.0	1		
2	12 58.4 -16.5	95.7	12 52.4 -17.6	95.9	12 46.1 -18.6	96.1	12 39.6 -19.6	96.3	12 32.8 -20.6	96.6	12 25.8 -21.6	96.8	12 18.6 -22.5	97.0	12 11.2 -23.6	97.2	12 00.0 -24.1	100.0	11 10.3 -23.1	99.8	11 00.0 -24.1	100.0	11 10.3 -23.1	99.8	11 00.0 -24.1	100.0	2		
3	12 41.9 -16.8	96.7	12 34.8 -17.8	96.9	12 27.5 -18.8	97.1	12 20.0 -19.8	97.3	12 12.2 -20.8	97.5	12 04.2 -21.7	97.7	11 56.1 -22.8	98.0	11 47.6 -23.7	98.2	11 00.0 -24.1	100.0	10 10.3 -23.1	99.8	10 00.0 -24.1	100.0	10 10.3 -23.1	99.8	10 00.0 -24.1	100.0	3		
4	12 25.1 -16.9	97.6	12 17.0 -17.9	97.9	12 08.7 -19.0	98.1	12 00.2 -20.0	98.3	11 51.4 -21.0	98.5	11 42.5 -22.0	98.7	11 33.3 -23.0	98.9	11 23.9 -23.9	99.1	11 00.0 -24.1	100.0	10 10.3 -23.1	99.8	10 00.0 -24.1	100.0	10 10.3 -23.1	99.8	10 00.0 -24.1	100.0	4		
5	12 08.2 -17.2	98.6	11 59.1 -18.2	98.8	11 49.7 -19.2	99.0	11 40.2 -20.2	99.2	11 30.4 -21.1	99.4	11 20.5 -22.2	99.6	11 10.3 -23.1	99.8	11 00.0 -24.1	100.0	10 10.3 -23.1	99.8	10 00.0 -24.1	100.0	10 10.3 -23.1	99.8	10 00.0 -24.1	100.0	5				
6	11 51.0 -17.4	99.6	11 40.9 -18.4	99.8	11 30.5 -19.3	100.0	11 20.0 -20.4	100.2	11 09.3 -21.4	100.4	10 58.3 -22.3	100.6	10 47.2 -23.3	100.8	10 35.9 -24.3	101.0	10 00.0 -24.1	100.0	9 10.3 -23.1	99.8	9 00.0 -24.1	100.0	9 10.3 -23.1	99.8	9 00.0 -24.1	100.0	6		
7	11 33.6 -17.6	100.6	11 22.5 -18.6	100.8	11 11.2 -19.6	101.0	10 59.6 -20.5	101.2	10 47.9 -21.5	101.4	10 36.0 -22.5	101.5	10 23.9 -23.4	101.7	10 11.6 -24.4	101.9	10 00.0 -24.1	100.0	9 10.3 -23.1	99.8	9 00.0 -24.1	100.0	9 10.3 -23.1	99.8	9 00.0 -24.1	100.0	7		
8	11 16.0 -17.7	101.6	11 03.9 -18.7	101.7	10 51.6 -19.7	101.9	10 39.1 -20.7	102.1	10 26.4 -21.7	102.3	10 13.5 -22.6	102.5	10 00.5 -23.7	102.7	9 47.2 -24.5	102.8	9 00.0 -24.1	100.0	8 10.3 -23.1	99.8	8 00.0 -24.1	100.0	8 10.3 -23.1	99.8	8 00.0 -24.1	100.0	8		
9	10 58.3 -18.0	102.5	10 45.2 -19.0	102.7	10 31.9 -20.0	102.9	10 18.4 -20.9	103.1	10 04.7 -21.9	103.3	9 50.9 -22.9	103.4	9 36.8 -23.7	103.6	9 22.7 -24.7	103.8	9 00.0 -24.1	100.0	8 10.3 -23.1	99.8	8 00.0 -24.1	100.0	8 10.3 -23.1	99.8	8 00.0 -24.1	100.0	9		
10	10 40.3 -18.1	103.5	10 26.2 -19.1	103.7	10 11.9 -20.0	103.9	9 57.5 -21.1	104.0	9 42.8 -22.0	104.2	9 28.0 -22.9	104.4	9 13.1 -23.9	104.5	8 58.0 -24.9	104.7	8 00.0 -24.1	100.0	7 10.3 -23.1	99.8	7 00.0 -24.1	100.0	7 10.3 -23.1	99.8	7 00.0 -24.1	100.0	10		
11	10 22.2 -18.3	104.5	10 07.1 -19.3	104.6	9 51.1 -19.3	104.8	9 36.4 -21.2	105.0	9 20.8 -22.1	105.1	9 05.1 -23.1	105.3	8 49.2 -24.1	105.4	8 33.1 -25.0	105.6	8 00.0 -24.1	100.0	7 10.3 -23.1	99.8	7 00.0 -24.1	100.0	7 10.3 -23.1	99.8	7 00.0 -24.1	100.0	11		
12	10 03.9 -18.5	105.4	9 47.8 -19.4	105.6	9 31.6 -20.4	105.8	9 15.2 -21.3	105.9	8 58.7 -22.3	106.1	8 42.0 -23.3	106.2	8 25.1 -24.1	106.4	8 08.1 -25.0	106.5	8 00.0 -24.1	100.0	7 10.3 -23.1	99.8	7 00.0 -24.1	100.0	7 10.3 -23.1	99.8	7 00.0 -24.1	100.0	12		
13	9 45.4 -18.6	106.4	9 28.4 -19.6	106.6	9 11.2 -20.5	106.7	8 53.9 -21.5	106.9	8 36.4 -22.5	107.0	8 18.7 -23.3	107.2	8 01.0 -24.3	107.3	7 43.1 -25.3	107.4	7 00.0 -24.1	100.0	6 10.3 -23.1	99.8	6 00.0 -24.1	100.0	6 10.3 -23.1	99.8	6 00.0 -24.1	100.0	13		
14	9 26.8 -18.8	107.4	9 08.8 -19.8	107.5	8 50.7 -20.7	107.7	8 32.4 -21.7	107.8	8 13.9 -22.5	108.0	7 55.4 -23.5	108.1	7 36.7 -24.5	108.2	7 17.8 -25.3	108.3	7 00.0 -24.1	100.0	6 10.3 -23.1	99.8	6 00.0 -24.1	100.0	6 10.3 -23.1	99.8	6 00.0 -24.1	100.0	14		
15	9 08.0 -19.0	108.3	8 49.0 -19.8	108.5	8 30.0 -20.9	108.6	8 10.7 -21.7	108.8	7 51.4 -22.7	108.9	7 31.9 -23.6	109.0	7 12.2 -24.5	109.1	6 52.5 -25.4	109.3	6 00.0 -24.1	100.0	5 10.3 -23.1	99.8	5 00.0 -24.1	100.0	5 10.3 -23.1	99.8	5 00.0 -24.1	100.0	15		
16	8 49.0 -19.0	109.3	8 29.2 -20.1	109.4	8 09.1 -20.9	109.6	7 49.0 -21.9	109.7	7 28.7 -22.8	109.8	7 08.3 -23.8	109.9	6 47.7 -24.6	110.1	6 27.1 -25.5	110.2	6 00.0 -24.1	100.0	5 10.3 -23.1	99.8	5 00.0 -24.1	100.0	5 10.3 -23.1	99.8	5 00.0 -24.1	100.0	16		
17	8 30.0 -19.3	110.2	8 09.1 -20.1	110.4	7 48.2 -21.1	110.5	7 27.1 -22.0	110.6	7 05.9 -23.0	110.8	6 44.5 -23.8	110.9	6 23.1 -24.7	111.0	6 01.6 -25.7	111.1	5 35.9 -25.7	111.2	5 00.0 -24.1	100.0	4 18.6 -25.9	111.3	4 08.6 -26.2	111.4	4 08.6 -26.2	111.5	4 08.6 -26.2	111.6	17
18	8 10.7 -19.3	111.2	7 49.0 -20.3	111.3	7 27.1 -21.2	111.5	7 05.1 -22.2	111.6	6 42.9 -23.0	111.7	6 20.7 -23.9	111.8	5 58.4 -24.8	111.9	5 35.9 -25.7	112.0	5 00.0 -24.1	100.0	4 18.6 -25.9	112.1	4 08.6 -26.2	112.2	4 08.6 -26.2	112.3	4 08.6 -26.2	112.4	18		
19	7 51.4 -19.5	112.2	7 28.7 -20.4	112.3	7 05.9 -21.4	112.4	6 42.9 -22.2	112.5	5 56.8 -24.6	112.7	5 33.6 -25.4	112.8	5 10.2 -25.7	112.9	5 00.0 -24.1	100.0	4 18.6 -25.9	113.0	4 08.6 -26.2	113.1	4 08.6 -26.2	113.2	4 08.6 -26.2	113.3	19				
20	7 31.9 -19.7	113.1	7 08.3 -20.6	113.2	6 44.5 -21.4	113.3	6 20.7 -22.3	113.5	5 56.8 -23.2	113.5	5 32.8 -24.1	113.6	5 08.7 -25.0	113.7	4 44.5 -25.9	113.8	4 00.0 -24.1	100.0	3 10.3 -23.1	99.8	3 00.0 -24.1	100.0	3 10.3 -23.1	99.8	3 00.0 -24.1	100.0	20		
21	7 12.2 -19.7	114.1	6 47.7 -20.6	114.2	6 23.1 -21.5	114.3	5 58.4 -22.5	114.4	5 33.6 -23.4	114.5	5 08.7 -24.2	114.6	4 43.7 -25.1	114.6	4 18.6 -25.9	114.7	4 00.0 -24.1	100.0	3 10.3 -23.1	99.8	3 00.0 -24.1	100.0	3 10.3 -23.1	99.8	3 00.0 -24.1	100.0	21		
22	6 52.5 -19.8	115.0	6 27.1 -20.8	115.1	6 01.6 -21.7	115.2	5 35.9 -22.5	115.3	5 10.2 -23.3	115.4	4 44.5 -24.3	115.5	4 18.6 -25.1	115.6	3 52.7 -26.0	115.6	3 00.0 -24.1	100.0	2 10.3 -23.1	99.8	2 00.0 -24.1	100.0	2 10.3 -23.1	99.8	2 00.0 -24.1	100.0	22		
23	6 32.7 -20.0	116.0	6 06.3 -20.8	116.1	5 39.9 -21.7	116.2	5 13.4 -22.6	116.2	4 46.9 -23.5	116.3	4 20.2 -24.3	116.4	3 53.5 -25.2	116.5	3 10.2 -24.7	116.6	3 00.0 -24.1	100.0	2 10.3 -23.1	99.8	2 00.0 -24.1	100.0	2 10.3 -23.1	99.8	2 00.0 -24.1	100.0	23		
24	6 12.7 -20.0	116.9	5 45.5 -20.9	117.0	4 56.4 -21.8	117.1	4 28.2 -22.8	118.0	3 59.9 -23.6	118.2	3 31.5 -24.4	118.3	2 48.9 -25.4	118.4	1 42.4 -26.1	118.5	1 00.0 -24.1	100.0	0 10.3 -23.1	99.8	0 00.0 -24.1	100.0	0 10.3 -23.1	99.8	0 00.0 -24.1	100.0	24		
25	5 52.7 -20.2	117.9	5 24.6 -21.1	118.0	4 56.4 -21.9	118.1	4 28.2 -22.8	118.1	3 59.9 -23.6	118.2	3 31.5 -24.4	118.3	2 48.9 -25.4	118.4	1 42.4 -26.1	118.5	1 00.0 -24.1	100.0	0 10.3 -23.1	99.8	0 00.0 -24.1	100.0	0 10.3 -23.1	99.8	0 00.0 -24.1	100.0	25		
26	5 32.5 -20.2	118.8	5 03.5 -21.1	118.9	4 34.5 -21.9	119.0	4 05.4 -22.8	119.0	3 07.6 -23.7	119.1	3 07.1 -24.5	119.1	2 37.8 -25.3	119.2	1 00.0 -24.1	100.0	0 10.3 -23.1	99.8	0 00.0 -24.1	100.0	0 10.3 -23.1	99.8	0 00.0 -24.1	100.0	26				
27	5 12.3 -20.4	119.8	4 42.4 -21.1	119.8	4 12.6 -22.1	119.9	4 12.6 -22.1	119.9	3 42.6 -22.8	120.0	3 12.6 -23.7	120.0	2 42.6 -24.5	120.1	2														

77°, 283° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180°Zn=7
L.H.A. less than 180°Zn=360°-Z

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	
0	12 33.0 +15.8	93.4	12 29.3 +16.8	93.6	12 25.4 +17.8	93.9	12 21.2 +18.9	94.1	12 16.8 +19.9	94.3	12 12.2 +20.9	94.5	12 07.4 +21.9	94.7	12 02.3 +22.9	94.9	0	12 0.9 -10.8	94.7	12 0.2 +22.9	94.9	0	12 0.9 -10.8	94.7	0
1	12 48.8 +15.6	92.4	12 46.1 +16.6	92.7	12 43.2 +17.7	92.9	12 40.1 +18.6	93.1	12 36.7 +19.7	93.3	12 33.1 +20.7	93.6	12 29.3 +21.7	93.8	12 25.2 +22.7	94.0	1	12 4.4 -10.9	92.4	12 4.2 +22.7	94.0	1	12 4.4 -10.9	92.4	0
2	13 04.4 +15.3	91.4	13 02.7 +16.4	91.7	13 00.9 +17.4	91.9	12 58.7 +18.5	92.1	12 56.4 +19.5	92.4	12 53.8 +20.5	92.6	12 51.0 +21.4	92.8	12 47.9 +22.5	93.0	2	13 3.1 -9.8	91.4	13 1.4 +22.5	93.0	2	13 3.1 -9.8	91.4	0
3	13 19.7 +15.1	90.4	13 19.1 +16.2	90.7	13 18.3 +17.2	90.9	13 17.2 +18.2	91.2	13 15.9 +19.2	91.4	13 14.3 +20.2	91.6	13 12.4 +21.3	91.9	13 10.4 +22.2	92.1	3	13 34.8 +14.9	89.5	13 35.3 +15.9	89.9	3	13 34.8 +14.9	89.5	0
4	13 49.7 +14.7	88.5	13 51.2 +15.7	88.7	13 52.4 +16.8	88.9	13 53.4 +17.8	89.2	13 54.1 +18.8	89.4	13 54.6 +19.2	89.7	13 54.8 +20.8	89.9	13 54.7 +21.8	90.2	4	14 0.4 +14.3	87.5	14 0.6 +15.4	87.7	4	14 0.4 +14.3	87.5	0
5	14 44.2 +14.3	87.5	14 06.9 +15.4	87.7	14 09.2 +16.4	88.0	14 11.2 +17.5	88.2	14 12.9 +18.5	88.5	14 14.4 +19.5	88.7	14 15.6 +20.6	89.0	14 16.5 +21.6	89.2	5	14 18.7 +14.2	86.5	14 22.3 +15.2	86.7	5	14 18.7 +14.2	86.5	0
6	14 32.9 +13.9	85.5	14 37.5 +14.9	85.7	14 41.9 +15.9	86.0	14 45.9 +17.1	86.2	14 49.7 +18.1	86.5	14 53.3 +19.0	86.8	14 56.5 +20.1	87.0	14 59.5 +21.1	87.3	6	14 46.8 +13.6	84.4	14 52.4 +14.7	84.7	6	14 46.8 +13.6	84.4	0
7	15 00.4 +13.3	83.4	15 07.1 +14.4	83.7	15 13.5 +15.5	84.0	15 19.7 +16.5	84.2	15 25.6 +17.5	84.5	15 31.2 +18.5	84.8	15 36.5 +19.5	85.1	15 41.5 +20.6	85.4	7	15 13.7 +13.1	82.4	15 21.5 +14.1	82.7	7	15 13.7 +13.1	82.4	0
8	15 26.8 +12.8	81.4	15 35.6 +13.9	81.7	15 44.2 +14.9	82.0	15 52.4 +16.0	82.2	16 00.4 +16.9	82.5	16 08.0 +18.0	82.8	16 15.4 +19.0	83.1	16 22.4 +20.1	83.4	8	15 39.6 +12.6	80.4	15 49.5 +13.6	80.7	8	15 39.6 +12.6	80.4	0
9	15 52.2 +12.2	79.4	16 03.1 +13.3	79.7	16 13.7 +14.3	80.0	16 24.0 +15.4	80.2	16 34.0 +16.4	80.5	16 43.7 +17.5	80.8	16 53.2 +18.4	81.1	17 02.3 +19.5	81.4	9	16 04.4 +12.0	78.4	16 16.4 +13.0	78.7	9	16 04.4 +12.0	78.4	0
10	16 16.4 +11.6	77.3	16 29.4 +12.7	77.6	16 42.1 +13.7	77.9	16 54.5 +14.7	78.2	17 06.6 +15.8	78.5	17 18.3 +16.9	78.8	17 29.8 +17.9	79.1	17 41.0 +18.9	79.4	10	16 28.0 +11.4	76.3	16 42.1 +12.4	76.6	10	16 28.0 +11.4	76.3	0
11	16 39.4 +11.0	75.3	16 54.5 +12.1	75.6	17 09.2 +13.2	75.9	17 23.7 +14.2	76.2	17 37.9 +15.2	76.5	17 51.7 +16.3	76.8	18 05.3 +17.2	77.1	18 18.5 +18.3	77.4	11	16 50.4 +10.8	74.3	17 06.6 +11.7	74.6	11	16 50.4 +10.8	74.3	0
12	17 01.2 +10.4	73.2	17 18.3 +11.5	73.5	17 35.2 +12.5	73.8	17 51.7 +13.6	74.1	18 08.0 +14.5	74.5	18 23.9 +15.6	74.8	18 39.5 +16.6	75.1	18 54.7 +17.7	75.4	12	17 11.6 +10.2	72.2	17 29.8 +11.2	72.5	12	17 11.6 +10.2	72.2	0
13	17 21.8 +9.8	71.2	17 41.0 +10.8	71.5	17 59.9 +11.8	71.8	18 18.5 +12.8	72.1	18 36.8 +13.9	72.4	18 54.7 +14.9	72.7	19 12.4 +15.9	73.1	19 29.7 +16.9	73.4	13	17 31.6 +9.5	70.1	17 51.8 +10.5	70.4	13	17 31.6 +9.5	70.1	0
14	17 41.1 +9.1	69.1	18 02.3 +10.2	69.4	18 23.2 +11.2	69.7	18 43.9 +12.2	70.0	19 04.2 +13.2	70.4	19 24.2 +14.3	70.7	19 43.9 +15.2	71.0	20 03.2 +16.3	71.4	14	17 50.2 +8.9	68.1	18 12.5 +9.8	68.4	14	17 50.2 +8.9	68.1	0
15	18 02.4 +8.7	67.0	18 22.3 +9.5	67.3	18 45.3 +10.5	67.6	19 07.9 +11.6	68.0	19 30.3 +12.5	68.3	19 52.3 +13.6	68.6	20 14.0 +14.6	69.0	20 35.4 +15.5	69.3	15	18 38.2 +6.7	61.8	19 06.4 +7.7	62.1	15	18 38.2 +6.7	61.8	0
16	18 07.5 +8.2	66.0	18 31.8 +9.2	66.3	18 55.8 +10.1	66.6	19 19.5 +11.1	66.9	19 42.8 +12.2	67.3	20 05.9 +13.1	67.6	20 28.6 +14.1	67.9	20 50.9 +15.2	68.3	16	18 18.2 +4.3	54.4	19 53.0 +5.1	54.7	16	18 18.2 +4.3	54.4	0
17	18 15.7 +7.8	65.0	18 41.0 +8.8	65.3	19 05.9 +9.8	65.6	19 30.6 +10.8	65.9	19 55.0 +11.8	66.2	20 19.0 +12.8	66.5	20 42.7 +13.8	66.9	21 06.1 +14.8	67.2	17	18 23.5 +7.5	63.9	18 49.8 +8.4	64.2	17	18 23.5 +7.5	63.9	0
18	18 31.0 +7.2	62.9	18 58.2 +8.2	63.2	19 25.2 +9.1	63.5	19 51.8 +10.1	63.8	20 18.2 +11.0	64.1	20 44.2 +12.0	64.5	21 09.9 +13.0	64.8	21 35.3 +14.0	65.2	18	18 38.2 +6.7	61.8	19 06.4 +7.7	62.1	18	18 38.2 +6.7	61.8	0
19	18 44.9 +6.5	60.8	19 14.1 +7.4	61.1	19 43.0 +8.3	61.4	20 11.6 +9.3	61.7	20 39.9 +10.3	62.0	21 07.9 +11.2	62.4	21 35.6 +12.2	62.7	22 02.9 +13.2	63.1	19	18 51.4 +6.1	59.7	19 21.5 +7.0	60.0	19	18 51.4 +6.1	59.7	0
20	18 57.5 +5.7	58.7	19 28.5 +6.7	59.0	19 59.3 +7.6	59.3	20 29.8 +8.6	59.6	21 00.1 +9.5	59.9	21 30.0 +10.5	60.3	21 59.6 +11.4	60.6	22 28.9 +12.4	61.0	20	19 40.3 +5.3	57.6	19 35.2 +6.3	57.9	20	19 40.3 +5.3	57.6	0
21	19 03.2 +5.3	56.6	19 41.5 +5.9	56.9	20 14.2 +6.8	57.2	20 46.6 +7.7	57.5	21 18.7 +8.7	57.8	21 50.5 +9.7	58.1	22 22.0 +10.6	58.5	22 53.3 +11.5	58.8	21	19 36.6 +4.6	55.5	19 47.4 +5.6	55.8	21	19 36.6 +4.6	55.5	0
22	19 31.1 +2.8	50.2	20 11.4 +3.6	50.5	20 49.5 +4.5	50.8	21 27.3 +5.3	51.1	22 04.8 +6.3	51.4	22 42.1 +7.2	51.7	23 19.2 +8.0	52.0	23 55.9 +9.7	56.2	22	19 21.8 +2.8	46.0	20 23.7 +2.1	46.2	22	19 21.8 +2.8	46.0	0
23	19 35.9 +2.4	49.2	20 15.0 +3.3	49.4	20 54.0 +4.1	49.7	21 32.6 +5.0	50.0	22 11.1 +5.8	50.3	22 49.3 +6.6	50.6	23 27.2 +7.5	51.0	24 04.8 +8.5	51.3	23	19 33.1 -3.9	31.1	20 17.6 -1.4	31.3	23	19 33.1 -3.9	31.1	0
24	19 38.2 +2.1	48.1	20 18.3 +2.9	48.4	20 58.1 +3.7	48.6	21 37.6 +4.5	48.9	22 16.9 +5.4	49.2	22 55.9 +6.3	49.6	23 34.7 +7.1	49.9	24 13.3 +7.9	50.2	24	19 40.4 +1.7	47.0	20 21.2 +2.5	47.3	24	19 40.4 +1.7	47.0	0
25	19 42.1 +1.3	46.0	20 23.7 +2.1	46.2	21 05.1 +2.9	46.5	21 46.3 +3.7	46.8	22 27.3 +4.5	47.1	23 08.0 +5.3	47.4	23 48.5 +6.2	47.7	24 28.7 +7.1	48.0	25	19 44.2 +0.9	44.9	20 25.8 +1.7	45.2	25	19 44.2 +0.9	44.9	0
26	19 43.4 +0.9	44.9	20 25.8 +1.7	45.2	21 08.0 +2.5	45.4	21 50.0 +3.3	45.7	22 31.8 +4.1	46.0	23 13.3 +5.0	46.3	23 54.7 +5.7	46.6	24 35.8 +6.5	47.0	26	19 43.4 +0.9	44.9	20 27.5 +1.3	45.4	26	19 43.4 +0.9	44.9	0
27	19 44.3 +0.6	43.8	20 27.5 +1.3	44.1	21 10.5 +2.1	44.4	21 53.3 +2.9	44.6	22 35.9 +3.7	44.9	23 18.3 +4.5	45.2	24 00.4 +5.3	45.5	24 42.3 +6.1	45.9	27	19 44.9 +0.2	42.8	20 28.8 +1.0	43.0	27	19 44.9 +0.2	42.8	0
28	19 45.1 -0.2	41.7	20 29.8 +0.5	42.0	21 14.3 +1.3	42.2	21 58.6 +2.1	42.5	22 42.8 +2.8	42.8	23 26.7 +3.6	43.1	23 41.8 +6.7	43.8	24 21.2 +7.5	45.1	28	19 45.1 -0.2	41.7	20 29.8 +0.5	42.0	28	19 45.1 -0.2	41.7	0
29	19 49.4 -0.6	40.7	20 30.3 +0.2	40.9	21 15.6 +0.9	41.1	22 00.7 +1.6	41.4	22 45.6 +2.3	41.7	23 30.3 +3.1	42.0	24 14.8 +3.9	42.3	24 59.1 +4.6	42.6	29	19 44.3 -0.9	39.6	20 30.5 -0.3	40.1	29	19 44.3 -0.9	39.6	0
30	19 43.4 -1.4	38.5	20 30.2 -0.6	38.8	21 16.9 +0.1	39.0	22 03.5 +0.7	39.2	22 49.9 +1.4	39.5	23 36.1 +2.2	39.8	24 22.1 +2.9	40.1	25 07.9 +3.6	40.4	30	19 42.0 -0.7	37.5	20 29.6 -1.0	37.7	30	19 42.0 -0.7	37.5	0
31	19 40.3 -2.0	36.4	21 16.7 -0.8	36.9	22																				

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 77°, 283°

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.			
	Hc	d	Z																									
0	12 33.0	-16.0	93.4	12 29.3	-17.1	93.6	12 25.4	-18.1	93.9	12 21.2	-19.1	94.1	12 16.8	-20.1	94.3	12 12.2	-21.1	94.5	12 07.4	-22.1	94.7	12 02.3	-23.1	94.9	0			
1	12 17.0	-16.3	94.4	12 12.2	-17.2	94.6	12 07.3	-18.3	94.8	12 02.1	-19.3	95.1	11 56.7	-20.3	95.3	11 51.1	-21.3	95.5	11 45.3	-22.3	95.7	11 39.2	-23.2	95.9	1			
2	12 00.7	-16.4	95.4	11 55.0	-17.5	95.6	11 49.0	-18.4	95.8	11 42.8	-19.4	96.0	11 36.4	-20.4	96.2	11 29.8	-21.4	96.4	11 23.0	-22.4	96.6	11 16.0	-23.5	96.8	2			
3	11 44.3	-16.6	96.4	11 37.5	-17.6	96.6	11 30.6	-18.7	96.8	11 23.4	-19.7	97.0	11 16.0	-20.7	97.2	11 08.4	-21.7	97.4	11 00.6	-22.7	97.6	10 52.5	-23.6	97.8	3			
4	11 27.7	-16.9	97.4	11 19.9	-17.9	97.6	11 11.9	-18.9	97.8	11 03.7	-19.9	97.9	10 55.3	-20.8	98.1	10 46.7	-21.8	98.3	10 37.9	-22.8	98.5	10 28.9	-23.7	98.7	4			
5	11 10.8	-17.0	98.3	11 02.0	-18.0	98.5	10 53.0	-19.0	98.7	10 43.8	-20.0	98.9	10 34.5	-21.1	99.1	10 24.9	-22.0	99.3	10 15.1	-22.9	99.5	10 05.2	-24.0	99.6	5			
6	10 53.8	-17.2	99.3	10 44.0	-18.2	99.5	10 34.0	-19.2	99.7	10 23.8	-20.2	99.9	10 13.4	-21.1	100.0	10 02.9	-22.2	100.2	9 52.2	-23.2	100.4	9 41.2	-24.0	100.6	6			
7	10 36.6	-17.4	100.3	10 25.8	-18.4	100.5	10 14.8	-19.4	100.6	10 03.6	-20.3	100.8	9 52.3	-21.4	101.0	9 40.7	-22.3	101.2	9 29.0	-23.2	101.3	9 17.2	-24.3	101.5	7			
8	10 19.2	-17.5	101.3	10 07.4	-18.5	101.4	9 55.4	-19.5	101.6	9 43.3	-20.6	101.8	9 30.9	-21.5	101.9	9 18.4	-22.4	102.1	9 05.8	-23.4	102.3	8 52.9	-24.3	102.4	8			
9	10 01.7	-17.8	102.2	9 48.9	-18.8	102.4	9 35.9	-19.7	102.6	9 22.7	-20.6	102.7	9 09.4	-21.6	102.9	8 56.0	-22.6	103.0	8 42.4	-23.6	103.2	8 28.6	-24.5	103.3	9			
10	9 43.9	-17.9	103.2	9 30.1	-18.8	103.4	9 16.2	-19.9	103.5	9 02.1	-20.8	103.7	8 47.8	-21.8	103.8	8 33.4	-22.7	104.0	8 18.8	-23.7	104.1	8 04.1	-24.6	104.3	10			
11	9 26.0	-18.0	104.2	9 11.3	-19.1	104.3	8 56.3	-20.0	104.5	8 41.3	-21.0	104.6	8 26.0	-21.9	104.8	8 10.7	-22.9	104.9	7 55.1	-23.8	105.1	7 39.5	-24.7	105.2	11			
12	9 08.0	-18.2	105.1	8 52.2	-19.1	105.3	8 36.3	-20.1	105.4	8 20.3	-21.1	105.6	8 04.1	-22.0	105.7	7 47.8	-23.0	105.9	7 31.3	-23.9	106.0	7 14.8	-24.9	106.1	12			
13	8 49.8	-18.4	106.1	8 33.1	-19.4	106.2	8 16.2	-20.3	106.4	7 59.2	-21.2	106.5	7 42.1	-22.2	106.7	7 24.8	-23.1	106.8	7 07.4	-24.0	106.9	6 49.9	-24.9	107.0	13			
14	8 31.4	-18.5	107.1	8 13.7	-19.4	107.2	7 55.9	-20.4	107.3	7 38.0	-21.4	107.5	7 19.9	-22.3	107.6	7 01.7	-23.2	107.7	6 43.4	-24.1	107.8	6 25.0	-25.1	107.9	14			
15	8 12.9	-18.6	108.0	7 54.3	-19.6	108.2	7 35.5	-20.5	108.3	7 16.6	-21.4	108.4	6 57.6	-22.4	108.5	6 38.5	-23.3	108.6	6 19.3	-24.3	108.8	5 59.9	-25.1	108.9	15			
16	7 54.3	-18.8	109.0	7 34.7	-19.7	109.1	7 15.0	-20.6	109.2	6 55.2	-21.6	109.4	6 35.2	-22.5	109.5	6 15.2	-23.4	109.6	5 55.0	-24.3	109.7	5 34.8	-25.2	109.8	16			
17	7 35.5	-18.9	109.9	7 15.0	-19.8	110.1	6 54.4	-20.8	110.2	6 33.6	-21.7	110.3	6 12.7	-22.5	110.4	5 51.8	-23.5	110.5	5 30.7	-24.4	110.6	5 09.6	-25.3	110.7	17			
18	7 16.6	-19.0	110.9	6 55.2	-20.0	111.0	6 33.6	-20.9	111.1	6 11.9	-21.7	111.2	5 50.2	-22.7	111.3	5 28.3	-23.6	111.4	5 06.3	-24.4	111.5	4 44.3	-25.4	111.6	18			
19	6 57.6	-19.1	111.9	6 35.2	-20.0	112.0	6 12.7	-20.9	112.1	5 50.2	-21.9	112.2	5 27.5	-22.8	112.3	5 04.7	-23.7	112.3	4 41.9	-24.6	112.4	4 18.9	-25.4	112.5	19			
20	6 38.5	-19.2	112.8	6 15.2	-20.2	112.9	5 51.8	-21.1	113.0	5 28.3	-22.0	113.1	5 04.7	-22.8	113.2	4 41.0	-23.7	113.3	4 17.3	-24.6	113.3	3 53.5	-25.5	113.4	20			
21	6 19.3	-19.4	113.8	5 55.0	-20.2	113.9	5 30.7	-21.1	114.0	5 06.3	-22.0	114.0	4 41.9	-23.0	114.1	4 17.3	-23.8	114.2	3 52.7	-24.7	114.3	3 28.0	-25.5	114.3	21			
22	5 59.9	-19.4	114.7	5 34.8	-20.3	114.8	5 09.6	-21.2	114.9	4 44.3	-22.1	115.0	4 18.9	-23.0	115.0	3 53.5	-23.9	115.1	3 28.0	-24.7	115.2	3 02.5	-25.6	115.2	22			
23	5 40.5	-19.5	115.7	5 14.5	-20.5	115.8	4 48.4	-21.3	115.8	4 22.2	-22.2	115.9	3 55.9	-23.0	116.0	3 29.6	-23.9	116.0	3 03.3	-24.8	116.1	2 36.9	-25.6	116.1	23			
24	5 21.0	-19.7	116.6	4 54.0	-20.5	116.7	4 27.1	-21.4	116.8	4 00.0	-22.2	116.8	3 32.9	-23.1	116.9	3 05.7	-23.9	116.9	2 38.5	-24.8	117.0	2 11.3	-25.7	117.0	24			
25	5 01.3	-19.7	117.6	4 33.5	-20.5	117.6	4 05.7	-21.5	117.7	3 37.8	-22.3	117.8	3 09.8	-23.2	117.8	2 41.8	-24.0	117.9	2 13.7	-24.9	117.9	1 45.6	-25.7	117.9	25			
26	4 41.6	-19.7	118.5	4 13.0	-20.7	118.6	3 44.2	-21.5	118.6	3 15.5	-22.4	118.7	2 46.6	-23.2	118.7	2 17.8	-24.1	118.8	1 48.8	-24.8	118.8	1 19.9	-25.7	118.8	26			
27	4 21.9	-19.9	119.5	3 52.3	-20.7	119.5	3 22.7	-21.5	119.6	2 53.1	-22.4	119.6	2 23.4	-23.2	119.7	1 53.7	-24.1	119.7	1 24.0	-24.9	119.7	0 54.2	-25.7	119.7	27			
28	4 02.0	-19.9	120.4	3 31.6	-20.7	120.5	3 01.2	-21.6	120.5	2 30.7	-22.4	120.6	2 00.2	-23.3	120.6	1 29.6	-24.0	120.6	0 59.1	-24.9	120.6	0 28.5	-25.7	120.6	28			
29	3 42.1	-20.0	121.4	3 10.9	-20.8	121.4	2 39.6	-21.7	121.4	2 08.3	-22.5	121.5	1 36.9	-23.3	121.5	1 05.6	-24.2	121.5	0 34.2	-25.0	121.5	0 02.8	-25.7	121.5	29			
30	3 22.1	-20.0	122.3	2 50.1	-20.9	122.3	2 17.9	-21.6	122.4	1 45.8	-22.5	122.4	1 13.6	-23.3	122.4	0 41.4	-24.1	122.4	0 09.2	-24.9	122.5	0 22.9	+25.8	122.5	30			
31	3 02.1	-20.1	123.2	2 29.2	-20.8	123.3	1 56.3	-21.7	123.3	1 23.3	-22.5	123.3	0 50.3	-23.3	123.4	0 17.3	-24.1	123.4	0 15.7	+24.9	123.4	0 48.7	+25.7	123.4	31			
32	2 42.0	-20.1	124.2	2 08.3	-20.9	124.2	1 34.6	-21.8	124.2	1 00.8	-22.6	124.3	0 27.0	-23.6	124.3	0 06.8	+24.1	124.5	0 40.6	+24.9	124.5	0 30.9	+25.6	124.5	32			
33	2 21.9	-20.1	125.1	1 47.4	-21.0	125.2	1 12.8	-21.7	125.2	0 38.2	-22.5	125.2	0 03.7	-23.4	125.2	0 19.7	+23.4	125.2	0 30.9	+24.1	125.2	1 40.1	+25.6	125.2	33			
34	2 01.8	-20.2	126.1	1 26.4	-21.0	126.1	0 51.1	-21.8	126.1	0 15.7	-22.6	126.1	0 19.7	+23.3	126.1	0 55.0	+24.1	126.1	0 20.7	+25.7	126.1	0 05.7	+25.7	126.1	34			
35	1 41.6	-20.3	127.0	0 105.4	-21.0	127.0	0 29.3	-21.8	127.0	0 06.9	+22.5	127.0	0 43.0	+23.3	127.0	1 06.3	+23.3	127.0	1 55.3	+24.8	127.0	2 31.4	+25.6	127.0	35			
36	1 21.3	-20.2	128.0	0 44.4	-21.0	128.0	0 07.5	-21.8	128.0	0 14.3	+21.7	51.1	0 51.9	+22.6	51.1	1 29.6	+23.3	51.1	2 07.3	+24.1	51.1	2 20.1	+24.8	51.1	3 57.0	+25.5	51.1	36
37	1 01.1	-20.3	128.9	0 23.4	-21.0	128.9	0 36.0	+21.8	50.2	1 45.4	+22.5	50.2	1 52.9	+23.2	50.2	2 31.3	+24.0	50.2	3 09.7	+24.7								

78°, 282° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180°Zn=7
L.H.A. less than 180°Zn=360°-Z

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.	
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z		
0	11 35.1 +15.8	93.1	11 31.7 +16.8	93.4	11 28.1 +17.8	93.6	11 24.3 +18.8	93.8	11 20.2 +19.9	94.0	11 16.0 +20.8	94.2	11 11.5 +21.9	94.4	11 06.9 +22.8	94.6	11 00.0 +23.7	94.8	11 15.1 +24.6	95.0	11 29.7 +25.6	95.2	11 33.4 +26.6	95.4	11 29.7 +26.6	95.6
1	11 50.9 +15.5	92.2	11 48.5 +16.6	92.4	11 45.9 +17.6	92.6	11 43.1 +18.6	92.8	11 40.1 +19.6	93.0	11 36.8 +20.7	93.2	11 33.4 +21.6	93.4	11 29.7 +22.6	93.6	11 25.0 +23.5	93.8	11 22.3 +22.5	94.0	11 19.7 +22.6	94.2	11 15.0 +21.6	94.4	11 09.7 +22.6	94.6
2	12 06.4 +15.4	91.2	12 05.1 +16.3	91.4	12 03.5 +17.4	91.6	12 01.7 +18.4	91.8	11 59.7 +19.4	92.0	11 57.5 +20.4	92.2	11 55.0 +21.5	92.5	11 52.3 +22.5	92.7	11 49.7 +23.5	93.0	11 46.4 +22.5	93.2	11 42.5 +21.4	93.4	11 38.9 +22.4	93.6	11 34.7 +21.4	93.8
3	12 21.8 +15.1	90.2	12 21.4 +16.2	90.4	12 20.9 +17.2	90.6	12 20.1 +18.2	90.8	12 19.1 +19.3	91.1	12 17.9 +20.3	91.3	12 16.5 +21.2	91.5	12 14.8 +22.2	91.7	12 12.3 +23.2	91.9	12 10.7 +22.2	92.1	12 9.7 +22.2	92.3	12 8.7 +22.1	92.5	12 7.7 +22.1	92.7
4	12 36.9 +14.9	89.2	12 37.6 +15.9	89.4	12 38.1 +17.0	89.6	12 38.3 +18.0	89.9	12 38.4 +19.0	90.1	12 38.2 +20.0	90.3	12 37.7 +21.1	90.5	12 37.0 +22.1	90.8	12 36.0 +22.1	91.0	12 35.0 +22.1	91.2	12 34.0 +22.1	91.4	12 33.0 +22.1	91.6	12 32.0 +22.1	91.8
5	12 51.8 +14.7	88.2	12 53.5 +15.8	88.4	12 55.1 +16.7	88.7	12 56.3 +17.8	88.9	12 57.4 +18.8	89.1	12 58.2 +19.8	89.3	12 58.8 +20.8	89.6	12 59.1 +21.8	89.8	12 58.5 +21.8	89.9	12 57.8 +21.8	89.9	12 57.1 +21.8	89.9	12 56.4 +21.8	89.9	12 55.7 +21.8	89.9
6	13 06.5 +14.4	87.2	13 09.3 +15.4	87.4	13 11.8 +16.5	87.7	13 14.1 +17.6	87.9	13 16.2 +18.6	88.1	13 18.0 +19.6	88.4	13 19.6 +20.6	88.6	13 20.9 +21.6	88.9	13 22.3 +22.6	89.1	13 23.6 +22.6	89.3	13 24.9 +22.6	89.5	13 26.2 +22.6	89.7	13 27.5 +22.6	89.9
7	13 20.9 +14.2	86.2	13 24.7 +15.3	86.4	13 28.3 +16.3	86.7	13 31.7 +17.3	86.9	13 34.8 +18.3	87.2	13 37.6 +19.4	87.4	13 40.2 +20.4	87.7	13 42.5 +21.4	87.9	13 44.8 +22.4	88.1	13 47.1 +22.4	88.3	13 49.4 +22.4	88.5	13 51.7 +22.4	88.7	13 54.0 +22.4	88.9
8	13 35.1 +14.0	85.2	13 40.0 +15.0	85.5	13 44.6 +16.1	85.7	13 49.0 +17.1	85.9	13 53.1 +18.1	86.2	13 57.0 +19.1	86.4	14 00.6 +20.1	86.7	14 03.9 +21.2	86.9	14 07.2 +21.2	87.1	14 10.5 +21.2	87.3	14 13.8 +21.2	87.5	14 17.1 +21.2	87.7	14 20.4 +21.2	87.9
9	13 49.1 +13.7	84.2	13 55.0 +14.8	84.5	14 00.7 +15.8	84.7	14 06.1 +16.8	85.0	14 11.2 +17.9	85.2	14 20.7 +18.0	85.4	14 20.7 +19.0	85.5	14 25.1 +20.9	86.0	14 28.2 +20.9	86.0	14 28.2 +20.9	86.0	14 28.2 +20.9	86.0	14 28.2 +20.9	86.0	14 28.2 +20.9	86.0
10	14 02.8 +13.5	83.2	14 09.8 +14.5	83.5	14 16.5 +15.6	83.7	14 22.9 +16.6	84.0	14 29.1 +17.6	84.2	14 35.0 +18.7	84.5	14 40.7 +19.6	84.7	14 46.0 +20.7	85.0	14 51.3 +21.7	85.2	14 56.6 +21.7	85.5	15 01.9 +21.7	85.8	15 07.4 +21.7	86.0	15 13.9 +21.7	86.2
11	14 16.3 +13.2	82.2	14 24.3 +14.3	82.5	14 32.1 +15.3	82.7	14 39.5 +16.4	83.0	14 46.7 +17.4	83.2	14 53.7 +18.4	83.5	15 00.3 +19.5	83.8	15 06.7 +20.5	84.0	15 13.1 +20.5	84.3	15 20.5 +20.5	84.6	15 27.9 +20.5	84.8	15 35.3 +20.5	85.0	15 43.7 +20.5	85.2
12	14 29.5 +13.0	81.2	14 38.6 +14.0	81.5	14 47.4 +15.0	81.7	14 55.9 +16.1	82.0	15 04.1 +17.1	82.2	15 12.1 +18.1	82.5	15 19.8 +19.1	82.8	15 27.2 +20.2	83.1	15 34.9 +20.2	83.4	15 42.2 +20.2	83.7	15 50.1 +20.2	83.9	15 57.9 +20.2	84.1	15 65.7 +20.2	84.3
13	14 42.5 +12.7	80.2	14 52.6 +13.8	80.4	15 02.4 +14.8	80.7	15 12.0 +15.8	81.0	15 21.2 +16.9	81.2	15 30.2 +17.9	81.5	15 38.9 +18.9	81.8	15 47.4 +19.9	82.1	15 55.7 +20.9	82.4	16 03.3 +20.9	82.7	16 11.1 +20.9	83.0	16 18.8 +20.9	83.3	16 26.6 +20.9	83.6
14	14 55.2 +12.5	79.2	15 06.4 +13.4	79.4	15 17.2 +14.5	79.7	15 27.8 +15.5	80.0	15 38.1 +16.6	80.3	15 48.1 +17.6	80.5	15 57.8 +18.7	80.8	16 07.3 +19.6	81.1	16 15.1 +19.6	81.4	16 22.9 +19.6	81.7	16 30.7 +19.6	82.0	16 38.5 +19.6	82.3	16 46.3 +19.6	82.6
15	15 07.7 +12.1	78.2	15 19.8 +13.2	78.4	15 31.7 +14.3	78.7	15 43.3 +15.3	79.0	15 54.7 +16.3	79.3	16 05.7 +17.4	79.5	16 16.5 +18.3	79.8	16 26.9 +19.4	80.1	16 35.4 +19.4	80.4	16 44.2 +19.4	80.7	16 53.0 +19.4	81.0	16 61.7 +19.4	81.3	16 70.4 +19.4	81.6
16	15 19.8 +11.9	77.1	15 33.0 +13.0	77.4	15 46.0 +13.9	77.7	15 58.6 +15.0	78.0	16 11.0 +16.0	78.3	16 23.1 +17.0	78.5	16 34.8 +18.1	78.8	16 43.6 +19.1	79.1	16 52.4 +19.1	79.4	16 61.2 +19.1	79.7	16 70.0 +19.1	80.0	16 78.8 +19.1	80.3	16 87.6 +19.1	80.6
17	15 31.7 +11.6	76.1	15 46.0 +12.6	76.4	15 59.9 +13.7	76.7	16 13.6 +14.7	77.0	16 27.0 +15.7	77.2	16 40.1 +16.8	77.5	16 52.9 +17.8	77.8	17 05.4 +18.8	78.1	17 14.2 +18.8	78.4	17 23.0 +18.8	78.7	17 31.8 +18.8	79.0	17 40.6 +18.8	79.3	17 49.4 +18.8	79.6
18	15 43.3 +11.4	75.1	15 58.6 +12.4	75.4	16 13.6 +13.4	75.7	16 28.3 +14.4	76.0	16 42.7 +15.5	76.2	16 56.9 +16.4	76.5	17 10.7 +17.5	76.8	17 24.2 +18.5	77.1	17 32.8 +18.5	77.4	17 41.3 +18.5	77.7	17 49.8 +18.5	78.0	17 58.3 +18.5	78.3	17 66.8 +18.5	78.6
19	15 54.7 +11.0	74.1	16 11.0 +12.1	74.4	16 27.0 +13.1	74.7	16 42.7 +14.2	74.9	16 58.2 +15.1	75.2	17 13.3 +16.2	75.5	17 28.2 +17.2	75.8	17 42.7 +18.2	76.1	17 51.7 +18.2	76.4	18 01.6 +18.2	76.7	18 10.6 +18.2	77.0	18 19.6 +18.2	77.3	18 28.6 +18.2	77.6
20	16 05.7 +10.8	73.1	16 23.1 +11.7	73.3	16 40.1 +12.8	73.6	16 56.9 +13.8	73.9	17 13.3 +14.9	74.2	17 29.5 +15.9	74.5	17 45.4 +16.8	74.8	18 00.9 +17.9	75.1	18 18.8 +17.9	75.4	18 36.4 +17.9	75.7	18 53.6 +17.9	76.0	19 10.6 +17.9	76.3		
21	16 16.5 +10.4	72.0	16 34.8 +11.5	72.3	16 52.9 +12.5	72.6	17 10.7 +13.5	72.9	17 28.2 +14.5	73.2	17 45.4 +15.5	73.5	18 02.2 +16.6	73.8	18 18.8 +17.6	74.1	18 36.4 +17.6	74.4	19 14.1 +17.6	74.7	19 32.9 +17.6	75.0	19 50.7 +17.6	75.3	20 08.2 +17.6	75.6
22	16 26.9 +10.2	71.0	16 46.3 +11.2	71.3	17 05.4 +12.2	71.6	17 24.2 +13.2	71.9	17 42.7 +14.2	72.2	18 09.9 +15.2	72.5	18 18.8 +16.3	72.8	18 36.4 +17.2	73.1	18 53.6 +17.2	73.4	19 11.4 +17.2	73.7	19 29.1 +17.2	74.0	19 47.8 +17.2	74.3	20 06.0 +17.2	74.6
23	16 37.1 +9.8	70.0	16 57.5 +10.8	70.3	17 17.6 +11.9	70.6	17 37.4 +12.9	70.9	17 56.9 +13.9	71.2	18 16.1 +15.0	71.5	18 35.1 +15.9	71.8	18 53.6 +17.0	72.1	19 10.6 +16.6	72.4	19 28.1 +16.6	72.7	19 46.6 +16.6	73.0	20 04.0 +16.6	73.3		
24	16 46.9 +9.6	69.0	17 08.3 +10.6	69.2	17 29.5 +11.5	69.5	17 50.3 +12.6	69.8	18 08.6 +13.6	70.1	18 10.8 +13.6	70.4	18 31.1 +15.6	70.7	18 49.0 +16.6	71.0	19 08.0 +16.6	71.3	19 26.4 +16.6	71.6	19 44.8 +16.6	71.9	20 02.8 +16.6	72.2		
25	16 56.5 +9.2	67.9	17 18.9 +10.2	68.2	17 41.0 +11.2	68.5	18 02.9 +12.2	68.8	18 24.4 +13.2	69.1	18 45.6 +14.3	69.4	19 06.6 +15.2	69.8	19 27.2 +16.2	70.1	19 46.8 +16.2	70.4	20 04.8 +16.2	70.7	20 23.4 +16.2	71.0	21 02.4 +16.2	71.3	21 21.4 +16.2	71.6
26	17 05.7 +8.9	66.9	17 29.1 +9.9	67.2	17 52.2 +11.0	67.5	18 15.1 +11.9	67.8	18 37.6 +12.9	68.1	18 59.9 +13.9	68.4	19 21.8 +14.9	68.7	19 43.4 +15.9	69.1	20 05.9 +15.9	69.4	20 23.7 +15.9	69.7	21 03.4 +15.9	69.9	21 22.3 +15.9	70.2	22 01.3 +15.9	70.5
27	17 14.6 +8.6	65.9	17 39.0 +9.6	66.1	18 03.2 +10.5	66.4	18 27.0 +11.6	66.7	18 50.5 +12.6	67.1	19 13.8 +13.5	67.4	19 36.7 +14.5	67.7	19 53.3 +15.5	68.0	20 11.8 +15.5	68.3	20 29.7 +15.5	68.6	21 08.2 +15.5	68.9	21 25.7 +15.5	69.2	22 03.2 +15.5	69.5
28	17 23.2 +8.																									

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 78° , 282°

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	
0	11 35.1 -15.9	93.1	11 31.7 -17.0	93.4	11 28.1 -18.0	93.6	11 24.3 -19.0	93.8	11 20.2 -20.0	94.0	11 16.0 -21.0	94.2	11 11.5 -22.0	94.4	11 06.9 -23.0	94.6	11 03.0 -23.8	99.2	9 10.3 -23.8	99.2	5				
1	11 19.2 -16.2	94.1	11 14.7 -17.1	94.3	11 10.1 -18.2	94.5	11 05.3 -19.2	94.7	11 00.2 -20.2	94.9	10 55.0 -21.2	95.1	10 49.5 -22.2	95.3	10 43.9 -23.2	95.5	10 39.0 -23.2	95.5	1						
2	11 03.0 -16.3	95.1	10 57.6 -17.4	95.3	10 51.9 -18.3	95.5	10 46.1 -19.4	95.7	10 40.0 -20.3	95.9	10 33.8 -21.4	96.1	10 27.3 -22.3	96.2	10 20.7 -23.3	96.4	10 17.3 -23.3	96.4	2						
3	10 46.7 -16.5	96.1	10 40.2 -17.5	96.3	10 33.6 -18.6	96.5	10 26.7 -19.5	96.7	10 19.7 -20.6	96.8	10 12.4 -21.5	97.0	10 05.0 -22.5	97.2	9 57.4 -23.5	97.4	9 33.9 -23.6	98.3	3						
4	10 30.2 -16.7	97.1	10 22.7 -17.7	97.3	10 15.0 -18.7	97.4	10 07.2 -19.8	97.6	9 59.1 -20.7	97.8	9 50.9 -21.7	98.0	9 42.5 -22.7	98.1	9 33.9 -23.6	98.3	9 33.9 -23.6	98.3	4						
5	10 13.5 -16.9	98.0	10 05.0 -17.9	98.2	9 56.3 -18.9	98.4	9 47.4 -19.8	98.6	9 38.4 -20.8	98.7	9 29.2 -21.8	98.9	9 19.8 -22.8	99.1	9 10.3 -23.8	99.2	9 10.3 -23.8	99.2	5						
6	9 56.6 -17.0	99.0	9 47.1 -18.0	99.2	9 37.4 -19.0	99.4	9 27.6 -20.1	99.5	9 17.6 -21.1	99.7	9 07.4 -22.0	99.9	8 57.0 -22.9	100.0	8 46.5 -23.9	100.2	8 46.5 -23.9	100.2	6						
7	9 39.6 -17.3	100.0	9 29.1 -18.2	100.2	9 18.4 -19.2	100.3	9 07.5 -20.1	100.5	8 56.5 -21.1	100.6	8 45.4 -22.1	100.8	8 34.1 -23.1	100.9	8 22.6 -24.0	101.1	8 22.6 -24.0	101.1	7						
8	9 22.3 -17.3	101.0	9 10.9 -18.4	101.1	8 59.2 -19.4	101.3	8 47.4 -20.4	101.4	8 35.4 -21.3	101.6	8 23.3 -22.3	101.7	8 11.0 -23.2	101.9	7 58.6 -24.2	102.0	7 58.6 -24.2	102.0	8						
9	9 05.0 -17.5	101.9	8 52.5 -18.5	102.1	8 39.8 -19.4	102.2	8 27.0 -20.4	102.4	8 14.1 -21.4	102.5	8 0.0 -22.4	102.7	7 47.8 -23.4	102.8	7 34.4 -24.3	102.9	7 34.4 -24.3	102.9	9						
10	8 47.5 -17.7	102.9	8 34.0 -18.7	103.1	8 20.4 -19.7	103.2	8 06.6 -20.6	103.3	7 52.7 -21.6	103.5	7 38.6 -22.5	103.6	7 24.4 -23.4	103.7	7 10.1 -24.4	103.9	7 10.1 -24.4	103.9	10						
11	8 29.8 -17.8	103.9	8 15.3 -18.7	104.0	8 0.0 -19.7	104.2	7 46.0 -20.7	104.3	7 31.1 -21.6	104.4	7 16.1 -22.6	104.5	7 0.1 -23.6	104.7	6 45.7 -24.4	104.8	6 45.7 -24.4	104.8	11						
12	8 12.0 -18.0	104.8	7 56.6 -19.0	105.0	7 41.0 -19.9	105.1	7 25.3 -20.8	105.2	7 09.5 -21.8	105.4	6 53.5 -22.7	105.5	6 37.4 -23.6	105.6	6 21.3 -24.6	105.7	6 21.3 -24.6	105.7	12						
13	7 54.0 -18.0	105.8	7 37.6 -19.0	105.9	7 21.1 -20.0	106.1	7 04.5 -21.0	106.2	6 47.7 -21.9	106.3	6 30.8 -22.9	106.4	6 13.8 -23.8	106.5	5 56.7 -24.7	106.6	5 56.7 -24.7	106.6	13						
14	7 36.0 -18.2	106.8	7 18.6 -19.2	106.9	7 0.1 -20.1	107.0	6 43.5 -21.1	107.1	6 25.8 -22.0	107.2	6 0.7 -22.9	107.3	5 50.0 -23.8	107.4	5 32.0 -24.8	107.5	5 32.0 -24.8	107.5	14						
15	7 17.8 -18.4	107.7	6 59.4 -19.2	107.8	6 41.0 -20.2	108.0	6 22.4 -21.1	108.1	6 03.8 -22.1	108.2	5 45.0 -23.0	108.3	5 26.2 -24.0	108.4	5 07.2 -24.8	108.4	5 07.2 -24.8	108.4	15						
16	6 59.4 -18.4	108.7	6 40.2 -19.4	108.8	6 20.8 -20.4	108.9	6 01.3 -21.3	109.0	5 41.7 -22.2	109.1	5 22.0 -23.1	109.2	5 02.4 -22.0	109.3	4 42.4 -24.9	109.4	4 42.4 -24.9	109.4	16						
17	6 41.0 -18.6	109.6	6 20.8 -19.5	109.8	6 00.4 -20.4	109.9	5 40.0 -21.3	109.9	5 19.5 -22.3	110.0	4 58.9 -23.2	110.1	4 38.2 -24.1	110.2	4 17.5 -25.0	110.3	4 17.5 -25.0	110.3	17						
18	6 22.4 -18.6	110.6	6 0.3 -19.6	110.7	5 40.0 -20.5	110.8	5 18.7 -21.5	110.9	4 57.2 -22.3	111.0	4 35.7 -23.2	111.0	4 14.1 -24.1	111.1	3 52.5 -25.0	111.2	3 52.5 -25.0	111.2	18						
19	6 03.8 -18.8	111.6	5 41.7 -19.7	111.7	5 19.5 -20.6	111.7	4 57.2 -21.5	111.8	4 34.9 -22.4	111.9	4 12.5 -23.3	112.0	3 50.0 -23.8	112.0	3 27.5 -25.1	112.1	3 27.5 -25.1	112.1	19						
20	5 45.0 -18.8	112.5	5 22.0 -19.8	112.6	4 58.9 -20.7	112.7	4 35.7 -21.6	112.8	4 12.5 -22.5	112.8	3 49.2 -23.4	112.9	3 25.8 -24.3	113.0	3 02.4 -25.2	113.0	3 02.4 -25.2	113.0	20						
21	5 26.2 -19.0	113.5	5 02.2 -19.8	113.5	4 38.2 -20.7	113.6	4 14.1 -21.6	113.7	3 50.0 -22.5	113.8	3 25.8 -23.4	113.8	3 01.5 -24.3	113.9	2 37.2 -25.1	113.9	2 37.2 -25.1	113.9	21						
22	5 07.2 -19.0	114.4	4 42.4 -19.9	114.5	4 17.5 -20.9	114.6	3 52.5 -21.7	114.6	3 27.5 -22.6	114.7	3 02.4 -23.5	114.7	2 37.2 -24.3	114.8	2 12.1 -25.2	114.8	2 12.1 -25.2	114.8	22						
23	4 48.2 -19.1	115.4	4 22.5 -20.1	115.4	3 56.6 -20.8	115.5	3 30.8 -21.8	115.6	3 04.9 -22.7	115.6	2 38.9 -23.5	115.7	2 12.9 -24.4	115.7	1 46.9 -25.3	115.7	1 46.9 -25.3	115.7	23						
24	4 29.1 -19.2	116.3	4 02.4 -20.0	116.4	3 35.8 -21.0	116.4	3 09.0 -21.8	116.5	2 42.2 -22.7	116.5	2 15.4 -23.6	116.6	1 48.5 -24.4	116.6	1 21.6 -25.2	116.6	1 21.6 -25.2	116.6	24						
25	4 09.9 -19.2	117.3	3 42.4 -20.1	117.3	3 14.8 -21.0	117.4	2 47.2 -21.9	117.4	2 19.5 -22.7	117.5	1 51.8 -23.5	117.5	1 24.1 -24.4	117.5	0 56.4 -25.3	117.5	0 56.4 -25.3	117.5	25						
26	3 50.7 -19.4	118.2	3 22.3 -20.2	118.3	2 53.8 -21.0	118.3	2 25.3 -21.9	118.4	1 56.8 -22.8	118.4	1 28.3 -23.7	118.4	0 59.7 -24.5	118.4	0 31.1 -25.3	118.5	0 31.1 -25.3	118.5	26						
27	3 31.3 -19.3	119.2	3 02.1 -20.3	119.2	2 32.8 -21.1	119.3	2 03.4 -21.9	119.3	1 34.0 -22.7	119.3	1 04.6 -23.6	119.3	0 35.2 -24.4	119.4	0 0.58 -25.3	119.4	0 0.58 -25.3	119.4	27						
28	3 12.0 -19.5	120.1	2 41.8 -20.2	120.2	2 11.7 -21.1	120.2	1 41.5 -22.0	120.2	1 11.3 -22.8	120.2	0 41.0 -23.6	120.3	0 10.8 -24.5	120.3	0 19.5 -25.2	120.3	0 19.5 -25.2	120.3	28						
29	2 52.5 -19.4	121.1	2 21.6 -20.3	121.1	1 50.6 -21.2	121.1	1 19.5 -22.0	121.2	0 48.5 -22.8	121.2	0 17.4 -23.6	121.2	0 13.7 -24.4	121.2	0 44.7 -25.3	121.2	0 44.7 -25.3	121.2	29						
30	2 33.1 -19.5	122.0	2 01.3 -20.4	122.0	1 29.4 -21.2	122.1	0 57.5 -22.0	122.1	0 25.7 -22.9	122.1	0 0.62 +2.37	57.9	0 38.1 +24.5	57.9	1 10.0 +25.2	57.9	1 10.0 +25.2	57.9	30						
31	2 13.6 -19.6	123.0	1 40.9 -20.4	123.0	1 08.2 -21.2	123.0	0 35.5 -22.0	123.0	0 28.8 -22.8	123.0	0 29.9 +23.6	57.0	1 02.6 +24.4	57.0	1 35.2 +25.3	57.0	1 35.2 +25.3	57.0	31						
32	1 54.0 -19.6	123.9	1 20.5 -20.4	123.9	0 47.0 -21.2	123.9	0 13.5 -22.0	124.0	0 20.0 +2.28	56.1	0 53.5 +23.6	56.1	1 27.0 +24.4	56.1	2 00.5 +25.1	56.1	2 00.5 +25.1	56.1	32						
33	1 34.4 -19.6	124.8	1 00.1 -20.4	124.9	0 25.8 -21.2	124.9	0 0.85 +22.0	55.1	0 42.8 +22.8	55.1	1 17.1 +23.6	55.1	1 51.4 +24.4	55.2	2 25.6 +25.2	55.2	2 25.6 +25.2	55.2	33						
34	1 14.8 -19.6	125.8	0 39.7 -20.4	125.8	0 30.5 +22.0	54.2	0 30.5 +22.0	54.2	1 05.6 +22.8	54.2	1 40.7 +23.5	54.2	2 15.8 +24.3	54.2	2 50.8 +25.1	54.3	2 50.8 +25.1	54.3	34						
35	0 55.2 -19.6	126.7	0 19.3 -20.4	126.7	0 16.6 +20.5	53.3	0 52.5 +22.0	53.3	1 28.4 +22.7	53.3	2 04.2 +23.6	53.3	2 40.1 +24.3	53.3	3 15.9 +25.1	53.4	3 15.9 +25.1	53.4	35						
36	0 35.6 -19.7	127.7	0 0.1 +20.5	52.3	0 37.8 +21.2	52.3	1 14.5 +21.9	52.3	2 13.9 +22.7	51.4	2 51.3 +23.4	51.4	3 28.6 +24.2	51.5	4 06.0 +24.9	51.6	4 06.0 +24.9	51.6	36						
37	0 15.9 -19.7	128.6	0 21.6 +20.4	51.4	0 59.0 +21.2	51.4	1 20.2 +21.2	50.4	1 58.4 +21.9	50.5	2 36.6 +22.6	50.5	3 14.7 +23.4	50.5	3 52.8 +24.2	50.6	4 30.9 +24.9	50.6	38						
38	0 03.8 +19.6	50.4	0 42.0 +20.4	50.4	2 02.5 +21.1	48.5	2 42.2 +21.8	48.6	3 21.8 +22.6	48.6	4 01.5 +23.2	48.7	4 41.1 +24.0	48.7	5 20.6 +24.7	48.8	5 20.6 +24.7	48.8	40						

79°, 281° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180°Zn=7
L.H.A. less than 180°Zn=360°-Z

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	
0	10 37.2 +15.8	92.9	10 34.1 +16.8	93.1	10 30.8 +17.8	93.3	10 27.3 +18.8	93.4	10 23.6 +19.8	93.6	10 19.7 +20.8	93.8	10 15.7 +21.7	94.0	10 11.4 +22.8	94.2	10 0.0 +23.8	94.4	10 11.4 +22.8	94.2	10 0.0 +23.8	94.4	10 0.0 +23.8	94.4	0
1	10 53.0 +15.5	91.9	10 50.9 +16.5	92.1	10 48.6 +17.5	92.3	10 46.1 +18.6	92.5	10 43.4 +19.6	92.7	10 40.5 +20.6	92.8	10 37.4 +21.6	93.0	10 34.2 +22.5	93.2	10 31.1 +23.5	93.4	10 34.2 +22.5	93.2	10 31.1 +23.5	93.4	10 31.1 +23.5	93.4	1
2	11 08.5 +15.3	90.9	11 07.4 +16.4	91.1	11 06.1 +17.4	91.3	11 04.7 +18.4	91.5	11 03.0 +19.4	91.7	11 01.1 +20.4	91.9	11 05.0 +21.5	92.1	10 56.7 +22.5	92.3	11 02.0 +23.5	92.5	10 56.7 +22.5	92.3	11 02.0 +23.5	92.5	11 02.0 +23.5	92.5	2
3	11 23.8 +15.1	89.9	11 23.8 +16.1	90.1	11 23.5 +17.2	90.3	11 23.1 +18.2	90.5	11 22.4 +19.2	90.7	11 21.5 +20.3	90.9	11 20.5 +21.2	91.1	11 19.2 +22.2	91.3	11 03.3 +23.5	91.5	11 19.2 +22.2	91.3	11 03.3 +23.5	91.5	11 03.3 +23.5	91.5	3
4	11 38.9 +15.0	88.9	11 39.9 +16.0	89.1	11 40.7 +17.0	89.4	11 41.3 +18.0	89.6	11 41.6 +19.1	89.8	11 41.8 +20.0	90.0	11 41.7 +21.0	90.2	11 41.4 +22.0	90.4	11 41.4 +22.0	90.4	11 41.4 +22.0	90.4	11 41.4 +22.0	90.4	11 41.4 +22.0	90.4	4
5	11 53.9 +14.7	88.0	11 55.9 +15.7	88.2	11 57.7 +16.8	88.4	11 59.3 +17.8	88.6	12 00.7 +18.8	88.8	12 01.8 +19.8	89.0	12 02.7 +20.9	89.2	12 03.4 +21.9	89.4	12 03.4 +21.9	89.4	12 03.4 +21.9	89.4	12 03.4 +21.9	89.4	12 03.4 +21.9	89.4	5
6	12 08.6 +14.5	87.0	12 11.6 +15.6	87.2	12 14.5 +16.6	87.4	12 17.1 +17.6	87.6	12 19.5 +18.6	87.8	12 21.7 +19.6	88.0	12 23.6 +20.6	88.3	12 25.3 +21.6	88.5	12 25.3 +21.6	88.5	12 25.3 +21.6	88.5	12 25.3 +21.6	88.5	12 25.3 +21.6	88.5	6
7	12 23.1 +14.3	86.0	12 27.2 +15.3	86.2	12 31.1 +16.3	86.4	12 34.7 +17.4	86.6	12 38.1 +18.4	86.9	12 41.3 +19.4	87.1	12 44.2 +20.5	87.3	12 46.9 +21.5	87.5	12 46.9 +21.5	87.5	12 46.9 +21.5	87.5	12 46.9 +21.5	87.5	12 46.9 +21.5	87.5	7
8	12 37.4 +14.0	85.0	12 42.5 +15.1	85.2	12 47.4 +16.2	85.4	12 52.1 +17.2	85.6	12 56.5 +18.2	85.9	13 00.7 +19.2	86.1	13 04.7 +20.2	86.3	13 08.4 +21.2	86.6	13 08.4 +21.2	86.6	13 08.4 +21.2	86.6	13 08.4 +21.2	86.6	13 08.4 +21.2	86.6	8
9	12 51.4 +13.8	84.0	12 57.6 +14.9	84.2	13 03.6 +15.9	84.4	13 09.3 +16.9	84.7	13 14.7 +18.0	84.9	13 19.9 +19.0	85.1	13 24.9 +20.0	85.4	13 29.6 +21.0	85.6	13 29.6 +21.0	85.6	13 29.6 +21.0	85.6	13 29.6 +21.0	85.6	13 29.6 +21.0	85.6	9
10	13 05.3 +13.6	83.0	13 12.5 +14.7	83.2	13 19.5 +15.7	83.4	13 26.2 +16.7	83.7	13 32.7 +17.7	83.9	13 38.9 +18.8	84.2	13 44.9 +19.8	84.4	13 50.6 +20.8	84.6	13 50.6 +20.8	84.6	13 50.6 +20.8	84.6	13 50.6 +20.8	84.6	13 50.6 +20.8	84.6	10
11	13 18.9 +13.4	82.0	13 27.2 +14.4	82.2	13 35.2 +15.4	82.5	13 42.9 +16.5	82.7	13 50.4 +17.5	82.9	13 57.7 +18.5	83.2	14 04.7 +19.5	83.4	14 11.4 +20.6	83.7	14 11.4 +20.6	83.7	14 11.4 +20.6	83.7	14 11.4 +20.6	83.7	14 11.4 +20.6	83.7	11
12	13 32.3 +13.1	81.0	13 41.6 +14.1	81.2	13 50.6 +15.2	81.5	13 59.4 +16.2	81.7	14 07.9 +17.3	81.9	14 16.2 +18.3	82.2	14 24.2 +19.3	82.5	14 32.0 +20.3	82.7	14 32.0 +20.3	82.7	14 32.0 +20.3	82.7	14 32.0 +20.3	82.7	14 32.0 +20.3	82.7	12
13	13 45.4 +12.9	80.0	13 55.7 +14.0	80.2	14 05.8 +15.0	80.5	14 15.6 +16.0	80.7	14 25.2 +17.0	81.0	14 34.5 +18.0	81.2	14 43.5 +19.1	81.5	14 52.3 +20.0	81.7	14 52.3 +20.0	81.7	14 52.3 +20.0	81.7	14 52.3 +20.0	81.7	14 52.3 +20.0	81.7	13
14	13 58.3 +12.7	79.0	14 09.7 +13.7	79.2	14 20.8 +14.7	79.5	14 31.6 +15.8	79.7	14 42.2 +16.8	80.0	14 52.5 +17.8	80.2	15 02.6 +18.8	80.5	15 12.3 +19.9	80.8	15 12.3 +19.9	80.8	15 12.3 +19.9	80.8	15 12.3 +19.9	80.8	15 12.3 +19.9	80.8	14
15	14 11.0 +12.4	78.0	14 23.4 +13.4	78.2	14 35.5 +14.4	78.5	14 47.4 +15.4	78.7	14 59.0 +16.5	79.0	15 10.3 +17.5	79.2	15 21.4 +18.5	79.5	15 32.2 +19.5	79.8	15 32.2 +19.5	79.8	15 32.2 +19.5	79.8	15 32.2 +19.5	79.8	15 32.2 +19.5	79.8	15
16	14 23.4 +12.1	76.9	14 36.8 +13.1	77.2	14 49.9 +14.2	77.5	15 02.8 +15.3	77.7	15 15.5 +16.2	78.0	15 27.8 +17.3	78.2	15 39.9 +18.3	78.5	15 51.7 +19.3	78.8	15 51.7 +19.3	78.8	15 51.7 +19.3	78.8	15 51.7 +19.3	78.8	15 51.7 +19.3	78.8	16
17	14 35.5 +11.9	75.9	14 49.9 +12.9	76.2	15 04.1 +14.0	76.4	15 18.1 +14.9	76.7	15 31.7 +16.0	77.0	15 45.1 +17.0	77.3	15 58.2 +18.0	77.5	16 11.0 +19.0	77.8	16 11.0 +19.0	77.8	16 11.0 +19.0	77.8	16 11.0 +19.0	77.8	16 11.0 +19.0	77.8	17
18	14 47.4 +11.6	74.9	15 02.8 +12.7	75.2	15 18.1 +13.6	75.4	15 33.0 +14.7	75.7	15 47.7 +15.7	76.0	16 02.1 +16.7	76.3	16 16.2 +17.7	76.6	16 32.0 +18.7	76.8	16 32.0 +18.7	76.8	16 32.0 +18.7	76.8	16 32.0 +18.7	76.8	16 32.0 +18.7	76.8	18
19	14 59.0 +11.3	73.9	15 15.5 +12.3	74.2	15 31.7 +13.4	74.4	15 47.7 +14.4	74.7	16 03.4 +15.4	75.0	16 18.8 +16.4	75.3	16 33.9 +17.4	75.5	16 48.7 +18.5	75.8	16 48.7 +18.5	75.8	16 48.7 +18.5	75.8	16 48.7 +18.5	75.8	16 48.7 +18.5	75.8	19
20	15 10.3 +11.1	72.9	15 27.8 +12.1	73.2	15 45.1 +13.1	73.4	16 02.1 +14.1	73.7	16 18.8 +15.1	74.0	16 35.2 +16.1	74.3	16 51.3 +17.2	74.5	17 07.2 +18.1	74.8	17 07.2 +18.1	74.8	17 07.2 +18.1	74.8	17 07.2 +18.1	74.8	17 07.2 +18.1	74.8	20
21	15 21.4 +10.8	71.9	15 39.9 +11.8	72.1	15 58.2 +12.8	72.4	16 16.2 +13.8	72.7	16 33.9 +14.8	73.0	16 51.3 +15.8	73.2	17 08.5 +16.8	73.5	17 25.3 +17.9	73.8	17 25.3 +17.9	73.8	17 25.3 +17.9	73.8	17 25.3 +17.9	73.8	17 25.3 +17.9	73.8	21
22	15 32.2 +10.5	70.9	15 51.7 +11.5	71.1	16 11.0 +12.5	71.4	16 30.0 +13.5	71.7	16 48.7 +14.6	72.0	17 07.2 +15.5	72.2	17 25.3 +16.6	72.5	17 43.2 +17.5	72.8	17 43.2 +17.5	72.8	17 43.2 +17.5	72.8	17 43.2 +17.5	72.8	17 43.2 +17.5	72.8	22
23	15 42.7 +10.2	69.8	16 03.2 +11.2	70.1	16 23.5 +12.2	70.4	16 43.5 +13.3	70.6	17 03.3 +14.2	70.9	17 22.7 +15.3	71.2	17 41.9 +16.2	71.5	18 00.7 +17.3	71.8	18 00.7 +17.3	71.8	18 00.7 +17.3	71.8	18 00.7 +17.3	71.8	18 00.7 +17.3	71.8	23
24	15 52.9 +9.9	68.8	16 14.4 +11.0	69.1	16 35.3 +12.0	69.3	16 56.8 +12.9	69.6	17 17.5 +13.9	69.9	17 38.0 +14.9	70.2	17 58.1 +15.9	70.5	18 21.0 +16.9	70.8	18 21.0 +16.9	70.8	18 21.0 +16.9	70.8	18 21.0 +16.9	70.8	18 21.0 +16.9	70.8	24
25	16 02.8 +9.6	67.8	16 25.4 +10.6	68.0	16 47.7 +11.6	68.4	17 09.7 +12.6	68.8	17 31.4 +13.6	69.1	17 52.9 +14.6	69.2	18 14.0 +15.6	69.5	18 34.9 +16.6	69.8	18 34.9 +16.6	69.8	18 34.9 +16.6	69.8	18 34.9 +16.6	69.8	18 34.9 +16.6	69.8	25
26	16 12.4 +9.4	66.8	16 36.0 +10.3	67.0	16 59.3 +11.3	67.3	17 22.3 +12.3	67.6	17 45.0 +13.3	67.9	18 07.5 +14.3	68.2	18 29.6 +15.3	68.5	18 51.5 +16.3	68.8	18 51.5 +16.3	68.8	18 51.5 +16.3	68.8	18 51.5 +16.3	68.8	18 51.5 +16.3	68.8	26
27	16 21.8 +9.0	65.7	16 46.3 +10.0	66.0	17 10.6 +11.0	66.3	17 34.6 +12.0	66.6	17 58.3 +13.0	66.9	18 21.8 +13.9	67.2	18 44.9 +15.0	67.5	19 07.8 +15.9	67.8	19 07.8 +15.9	67.8	19 07.8 +15.9	67.8	19 07.8 +15.9	67.8	19 07.8 +15.9	67.8	27
28	16 30.8 +8.7	64.7	16 56.3 +9.7	65.0	17 21.6 +10.7	65.2	17 46.6 +11.6	65.5	18 11.3 +12.6	65.8	19 35.7 +13.6	66.1	18 59.9 +14.6	66.4	19 23.7 +15.6	66.7	19 23.7 +15.6	66.7	19 23.7 +15.6	66.7	19 23.7 +15.6	66.7	19 23.7 +15.6	66.7	28
29	16 39.5 +8.5	63.7	17 49.8 +7.8	58.7	18 20.8 +8.7	59.0	18 51.6 +9.8	59.3	19 22.0 +10.6	59.6	19 52.3 +11.5														

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 79°, 281°

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	
0	10 37.2 -15.8	92.9	10 34.1 -16.9	93.1	10 30.8 -17.9	93.3	10 27.3 -18.9	93.4	10 23.6 -19.9	93.6	10 19.7 -20.9	93.8	10 15.7 -22.0	94.0	10 11.4 -22.9	94.2	10 7.1 -23.8	94.4	9 2.8 -24.1	94.6	9 48.5 -23.1	95.1	9 53.7 -22.1	94.9	0
1	10 21.4 -16.1	93.9	10 17.2 -17.1	94.0	10 12.9 -18.1	94.2	10 08.4 -19.1	94.4	10 03.7 -20.1	94.6	9 58.8 -21.1	94.8	9 31.6 -22.2	95.9	9 25.4 -23.2	96.0	9 18.1 -23.1	95.7	9 31.6 -22.2	95.9	9 25.4 -23.2	96.0	2		
2	10 05.3 -16.3	94.8	10 00.1 -17.2	95.0	9 54.8 -18.3	95.2	9 49.3 -19.3	95.4	9 43.6 -20.3	95.5	9 37.7 -21.3	95.7	9 16.4 -21.4	96.7	9 09.4 -22.4	96.8	9 02.2 -23.4	97.0	9 01.9 -24.5	97.3	9 02.2 -23.4	97.0	3		
3	9 49.0 -16.4	95.8	9 42.9 -17.4	96.0	9 36.5 -18.4	96.2	9 30.0 -19.4	96.3	9 23.3 -20.4	96.5	9 16.4 -21.4	96.7	9 09.4 -22.4	96.8	9 02.2 -23.4	97.0	9 01.9 -24.5	97.3	9 02.2 -23.4	97.0	4				
4	9 32.6 -16.5	96.8	9 25.5 -17.6	97.0	9 18.1 -18.6	97.1	9 10.6 -19.6	97.3	9 02.9 -20.6	97.4	8 55.0 -21.5	97.6	8 47.0 -22.5	97.8	8 38.8 -23.5	97.9	8 38.8 -23.5	97.9	8 38.8 -23.5	97.9	4				
5	9 16.1 -16.8	97.8	9 07.9 -17.8	97.9	8 59.5 -18.7	98.1	8 51.0 -19.7	98.2	8 42.3 -20.7	98.4	8 33.5 -21.7	98.5	8 24.5 -22.7	98.7	8 15.3 -23.6	98.8	8 15.3 -23.6	98.8	8 15.3 -23.6	98.8	5				
6	8 59.3 -16.8	98.7	8 50.1 -17.8	98.9	8 40.8 -18.9	99.0	8 31.3 -19.9	99.2	8 21.6 -20.8	99.3	8 11.8 -21.8	99.5	8 01.8 -22.8	99.6	7 51.7 -23.7	99.8	7 51.7 -23.7	99.8	7 51.7 -23.7	99.8	6				
7	8 42.5 -17.1	99.7	8 32.3 -18.1	99.9	8 21.9 -19.0	100.0	8 11.4 -20.0	100.1	8 00.8 -21.0	100.3	7 50.0 -22.0	100.4	7 39.0 -22.9	100.6	7 28.0 -23.9	100.7	7 28.0 -23.9	100.7	7 28.0 -23.9	100.7	7				
8	8 25.4 -17.1	100.7	8 14.2 -18.1	100.8	8 02.9 -19.2	101.0	7 51.4 -20.1	101.1	7 39.8 -21.1	101.2	7 28.0 -22.0	101.4	7 16.1 -23.0	101.5	7 04.1 -24.0	101.6	7 04.1 -24.0	101.6	7 04.1 -24.0	101.6	8				
9	8 08.3 -17.4	101.6	7 56.1 -18.3	101.8	7 43.7 -19.2	101.9	7 31.3 -20.3	102.1	7 18.7 -21.2	102.2	7 06.0 -22.2	102.3	6 53.1 -23.1	102.4	6 40.1 -24.0	102.5	6 40.1 -24.0	102.5	6 40.1 -24.0	102.5	9				
10	7 50.9 -17.4	102.6	7 37.8 -18.5	102.7	7 24.5 -19.4	102.9	7 11.0 -20.3	103.0	6 57.5 -21.4	103.1	6 43.8 -22.3	103.2	6 30.0 -23.2	103.4	6 16.1 -24.2	103.5	6 16.1 -24.2	103.5	6 16.1 -24.2	103.5	10				
11	7 33.5 -17.6	103.6	7 19.3 -18.5	103.7	7 05.1 -19.5	103.8	6 50.7 -20.5	103.9	6 36.1 -21.4	104.1	6 21.5 -22.4	104.2	6 06.8 -23.4	104.3	5 51.9 -24.3	104.4	5 51.9 -24.3	104.4	5 51.9 -24.3	104.4	11				
12	7 15.9 -17.7	104.5	7 00.8 -18.7	104.7	6 45.6 -19.7	104.8	6 30.2 -20.6	104.9	6 14.7 -21.5	105.0	5 59.1 -22.5	105.1	5 43.4 -23.4	105.2	5 27.6 -24.3	105.3	5 27.6 -24.3	105.3	5 27.6 -24.3	105.3	12				
13	6 58.2 -17.8	105.5	6 42.1 -18.7	105.6	6 25.9 -19.7	105.7	6 09.6 -20.7	105.8	5 53.2 -21.7	105.9	5 36.6 -22.5	106.0	5 20.0 -23.5	106.1	5 03.3 -24.4	106.2	5 03.3 -24.4	106.2	5 03.3 -24.4	106.2	13				
14	6 40.4 -17.9	106.5	6 23.4 -18.9	106.6	6 06.2 -19.8	106.7	5 48.9 -20.8	106.8	5 31.5 -21.7	106.9	5 14.1 -22.7	107.0	4 56.5 -23.6	107.1	4 38.9 -24.5	107.1	4 38.9 -24.5	107.1	4 38.9 -24.5	107.1	14				
15	6 22.5 -18.0	107.4	6 04.5 -19.0	107.5	5 46.4 -20.0	107.6	5 28.1 -20.8	107.7	5 09.8 -21.8	107.8	4 51.4 -22.7	107.9	4 32.9 -23.6	108.0	4 14.4 -24.6	108.1	4 14.4 -24.6	108.1	4 14.4 -24.6	108.1	15				
16	6 04.5 -18.1	108.4	5 45.5 -19.1	108.5	5 26.4 -20.0	108.6	5 07.3 -21.0	108.7	4 48.0 -21.8	108.8	4 28.7 -22.8	108.8	4 09.3 -23.7	108.9	3 49.8 -24.6	109.0	3 49.8 -24.6	109.0	3 49.8 -24.6	109.0	16				
17	5 46.4 -18.3	109.3	5 26.4 -19.1	109.4	5 06.4 -20.1	109.5	4 46.3 -21.0	109.6	4 26.2 -22.0	109.7	4 05.9 -22.9	109.8	3 45.6 -23.8	109.8	3 25.2 -24.6	109.9	3 25.2 -24.6	109.9	3 25.2 -24.6	109.9	17				
18	5 28.1 -18.3	110.3	5 07.3 -19.3	110.4	4 46.3 -20.1	110.5	4 25.3 -21.1	110.5	4 04.2 -22.0	110.6	3 43.0 -22.9	110.7	3 21.8 -23.8	110.7	3 00.6 -24.8	110.8	3 00.6 -24.8	110.8	3 00.6 -24.8	110.8	18				
19	5 09.8 -18.4	111.3	4 48.0 -19.3	111.3	4 26.2 -20.3	111.4	4 04.2 -21.2	111.5	3 42.2 -22.1	111.6	3 20.1 -22.9	111.6	2 58.0 -23.9	111.7	2 35.8 -24.7	111.7	2 35.8 -24.7	111.7	2 35.8 -24.7	111.7	19				
20	4 51.4 -18.5	112.2	4 28.7 -19.4	112.3	4 05.9 -20.3	112.4	3 43.0 -21.2	112.4	3 20.1 -22.1	112.5	2 57.2 -23.1	112.5	2 34.1 -23.9	112.6	2 11.1 -24.8	112.6	2 11.1 -24.8	112.6	2 11.1 -24.8	112.6	20				
21	4 32.9 -18.5	113.2	4 09.3 -19.5	113.2	3 45.6 -20.4	113.3	3 21.8 -21.2	113.4	2 58.0 -22.2	113.4	2 34.1 -23.0	113.5	2 10.2 -23.9	113.5	1 46.3 -24.8	113.5	1 46.3 -24.8	113.5	1 46.3 -24.8	113.5	21				
22	4 14.4 -18.6	114.1	3 49.8 -19.5	114.2	3 25.2 -20.4	114.2	3 00.6 -21.4	114.3	2 35.8 -22.2	114.3	2 11.1 -23.1	114.4	1 46.3 -24.0	114.4	1 21.5 -24.8	114.4	1 21.5 -24.8	114.4	1 21.5 -24.8	114.4	22				
23	3 55.8 -18.7	115.1	3 30.3 -19.6	115.1	3 04.8 -20.5	115.2	2 39.2 -21.3	115.2	2 13.6 -22.2	115.3	1 48.0 -23.1	115.3	1 22.3 -23.9	115.3	0 56.7 -24.9	115.3	0 56.7 -24.9	115.3	0 56.7 -24.9	115.3	23				
24	3 37.1 -18.8	116.0	3 10.7 -19.6	116.1	2 44.3 -20.5	116.1	2 17.9 -21.4	116.2	1 51.4 -22.3	116.2	1 24.9 -23.2	116.2	0 58.4 -24.0	116.2	0 31.8 -24.8	116.3	0 31.8 -24.8	116.3	0 31.8 -24.8	116.3	24				
25	3 18.3 -18.8	117.0	2 51.1 -19.7	117.0	2 23.8 -20.6	117.1	1 56.5 -21.5	117.1	1 29.1 -22.3	117.1	1 01.7 -23.1	117.2	0 34.4 -24.1	117.2	0 07.0 -24.9	117.2	0 07.0 -24.9	117.2	0 07.0 -24.9	117.2	25				
26	2 59.5 -18.8	117.9	2 31.4 -19.7	118.0	2 03.2 -20.6	118.0	1 35.0 -21.4	118.0	1 06.8 -22.3	118.1	0 38.6 -23.2	118.1	0 10.3 -24.0	118.1	0 17.9 +24.9	118.1	0 17.9 +24.9	118.1	0 17.9 +24.9	118.1	26				
27	2 40.7 -18.9	118.9	2 11.7 -19.8	118.9	1 42.6 -20.6	119.0	1 13.6 -21.5	119.0	0 44.5 -22.3	119.0	0 22.2 -23.2	119.0	0 15.4 -23.2	119.0	0 13.7 +24.0	61.0	0 42.8 +24.8	61.0	0 42.8 +24.8	61.0	0 42.8 +24.8	61.0	27		
28	2 21.8 -19.0	119.8	1 51.9 -19.8	119.9	1 22.0 -20.6	119.9	0 52.1 -21.5	119.9	0 22.2 -22.4	119.9	0 07.8 +23.1	60.1	0 37.7 +24.0	60.1	1 07.6 +24.8	60.1	1 07.6 +24.8	60.1	1 07.6 +24.8	60.1	28				
29	2 02.8 -18.9	120.8	1 32.1 -19.3	120.8	1 01.4 -20.7	120.8	0 30.6 -21.5	120.8	0 00.2 +2.3	59.2	0 30.9 +2.3	59.2	1 01.7 +24.0	59.2	1 32.4 +24.8	59.2	1 32.4 +24.8	59.2	1 32.4 +24.8	59.2	29				
30	1 43.9 -19.0	121.7	1 12.3 -19.9	121.8	0 40.7 -20.7	121.8	0 09.1 -21.5	121.8	0 22.5 +22.3	58.2	0 44.8 +22.3	58.2	1 54.1 +23.1	58.2	1 25.7 +23.9	58.3	1 57.2 +24.8	58.3	1 57.2 +24.8	58.3	30				
31	1 24.9 -19.1	122.7	0 52.4 -19.4	122.7	0 20.0 -20.6	122.7	0 12.4 +2.3	57.3	0 44.8 +22.3	57.3	1 17.2 +23.7	57.3	1 49.6 +24.0	57.3	2 22.0 +24.7	57.4	2 22.0 +24.7	57.4	2 22.0 +24.7	57.4	31				
32	1 05.8 -19.0	123.6	0 32.6 -19.3	123.6	0 26.6 -20.7	123.6	0 0.6 +20.7	56.4	0 33.9 +21.5	56.4	1 07.1 +22.3	56.4	1 40.4 +20.3	56.4	2 13.6 +23.8	56.4	2 46.7 +24.7	56.5	2 46.7 +24.7	56.5	32				
33	0 46.8 -19.1	124.6	0 12.7 -19.8	124.6	0 21.0 +20.7	54.5	1 51.0 +20.7	54.5	1 51.7 +22.2	54.5	2 26.5 +23.0	54.5	3 01.3 +23.8	54.6	3 36.1 +24.6	54.6	3 36.1 +24.6	54.6	3 36.1 +24.6	54.6	34				
34	0 27.7 -19.0	125.5	0 07.1 +19.9	54.5	0 42.0 +20.7	54.5	1 47.4 +20.2	44.1	2 25.1 +20.6	44.1	3 23.9 +22.3	53.6	2 49.5 +23.0	53.6	3 25.1 +23.8	53.7	4 00.7 +24.5	53.7	4 00.7 +24.5	53.7	35				
35	0 08.7 -19.1	12																							

80°, 280° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180°Zn=7
L.H.A. less than 180°Zn=360°-Z

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	
0	9 39.4 +15.6	92.6	9 36.5 +16.7	92.8	9 33.5 +17.7	93.0	9 30.4 +18.7	93.1	9 27.0 +19.7	93.3	9 23.5 +20.7	93.5	9 19.8 +21.7	93.6	9 15.9 +22.7	93.8	9 12.0 +23.7	93.9	9 8.1 +24.7	93.9	9 4.2 +25.7	93.8	0		
1	9 55.0 +15.5	91.6	9 53.2 +16.5	91.8	9 51.2 +17.6	92.0	9 49.1 +18.5	92.2	9 46.7 +19.6	92.3	9 44.2 +20.6	92.5	9 41.5 +21.6	92.7	9 38.6 +22.6	92.8	9 35.1 +23.6	92.8	9 31.4 +24.6	92.8	9 27.7 +25.6	92.8	1		
2	10 10.5 +15.3	90.7	10 09.7 +16.4	90.8	10 08.8 +17.4	91.0	10 07.6 +18.4	91.2	10 06.3 +19.4	91.4	10 04.8 +20.4	91.5	10 03.1 +21.4	91.7	10 01.2 +22.3	91.9	10 00.0 +23.3	91.9	10 00.0 +24.3	91.9	10 00.0 +25.3	91.9	2		
3	10 25.8 +15.2	89.7	10 26.1 +16.2	89.9	10 26.2 +17.1	90.0	10 26.0 +18.2	90.2	10 25.7 +19.2	90.4	10 25.2 +20.2	90.6	10 24.5 +21.2	90.8	10 23.5 +22.3	91.0	10 22.8 +23.3	91.0	10 22.1 +24.3	91.0	10 21.4 +25.3	91.0	3		
4	10 41.0 +14.9	88.7	10 42.3 +16.0	88.9	10 43.3 +17.1	89.1	10 44.2 +18.1	89.3	10 44.9 +19.1	89.4	10 45.4 +20.0	89.6	10 45.7 +21.0	89.8	10 45.8 +22.0	90.0	10 45.8 +23.0	90.0	10 45.8 +24.0	90.0	10 45.8 +25.0	90.0	4		
5	10 55.9 +14.8	87.7	10 58.3 +15.7	87.9	11 00.4 +16.8	88.1	11 02.3 +17.8	88.3	11 04.0 +18.8	88.5	11 05.4 +19.9	88.7	11 06.7 +20.9	88.9	11 07.8 +21.9	89.1	11 08.9 +22.9	89.3	11 09.9 +23.9	89.3	11 10.9 +24.9	89.3	5		
6	11 10.7 +14.6	86.7	11 14.0 +15.7	86.9	11 17.2 +16.6	87.1	11 20.1 +17.7	87.3	11 22.8 +18.7	87.5	11 25.3 +19.7	87.7	11 27.6 +20.7	87.9	11 29.7 +21.7	88.1	11 31.1 +22.7	88.3	11 32.1 +23.7	88.3	11 33.1 +24.7	88.3	6		
7	11 25.3 +14.4	85.7	11 29.7 +15.4	85.9	11 33.8 +16.4	86.1	11 37.8 +17.4	86.3	11 41.5 +18.5	86.5	11 45.0 +19.5	86.7	11 48.3 +20.5	87.0	11 51.4 +21.5	87.2	11 54.4 +22.5	87.4	11 57.4 +23.5	87.6	11 59.4 +24.5	87.6	7		
8	11 39.7 +14.1	84.7	11 45.1 +15.2	84.9	11 50.2 +16.3	85.1	11 55.2 +17.3	85.4	12 00.0 +18.2	85.6	12 04.5 +19.3	85.8	12 08.8 +20.3	86.0	12 12.9 +21.3	86.2	12 16.9 +22.3	86.4	12 20.9 +23.3	86.6	12 24.9 +24.3	86.6	8		
9	11 53.8 +14.0	83.7	12 00.3 +15.0	83.9	12 06.5 +16.0	84.2	12 12.5 +17.0	84.4	12 18.2 +18.1	84.6	12 23.8 +19.1	84.8	12 29.1 +20.1	85.0	12 34.2 +21.1	85.3	12 38.2 +22.1	85.3	12 42.2 +23.1	85.3	12 46.2 +24.1	85.3	9		
10	12 07.8 +13.7	82.7	12 15.3 +14.7	83.0	12 22.5 +15.8	83.2	12 29.5 +16.8	83.4	12 36.3 +17.8	83.6	12 42.9 +18.8	83.8	12 49.2 +19.9	84.1	12 55.3 +20.8	84.3	12 58.3 +21.8	84.3	13 01.3 +22.8	84.3	13 04.3 +23.8	84.3	13 07.3 +24.8	84.3	10
11	12 21.5 +13.6	81.7	12 30.0 +14.6	82.0	12 38.3 +15.6	82.2	12 46.3 +16.7	82.4	12 54.1 +17.7	82.6	13 01.7 +18.7	82.9	13 09.1 +19.6	83.1	13 16.1 +20.7	83.3	13 23.1 +21.7	83.3	13 30.1 +22.7	83.3	13 37.1 +23.7	83.3	11		
12	12 35.1 +13.3	80.8	12 44.6 +14.3	81.0	12 53.9 +15.4	81.2	13 03.0 +16.3	81.4	13 11.8 +17.4	81.7	13 20.4 +18.4	81.9	13 28.7 +19.4	82.1	13 36.8 +20.4	82.4	13 44.8 +21.4	82.6	13 52.8 +22.4	82.8	13 59.8 +23.4	82.8	12		
13	12 48.4 +13.1	79.8	12 58.9 +14.1	80.0	13 09.3 +15.1	80.2	13 19.3 +16.2	80.4	13 29.2 +17.2	80.7	13 38.8 +18.2	80.9	13 48.1 +19.3	81.2	13 57.2 +20.3	81.4	13 65.2 +21.3	81.6	13 73.2 +22.3	81.8	13 81.2 +23.3	81.8	13		
14	13 01.5 +12.8	78.8	13 13.0 +13.9	79.0	13 24.4 +14.9	79.2	13 35.5 +15.9	79.4	13 46.4 +16.9	79.7	13 57.0 +17.9	80.0	14 07.4 +18.9	80.2	14 15.7 +19.9	80.4	14 24.0 +20.9	80.6	14 32.3 +21.9	80.6	14 40.6 +22.9	80.6	14		
15	13 14.3 +12.6	77.7	13 26.9 +13.7	78.0	13 39.3 +14.7	78.2	13 51.4 +15.7	78.5	14 03.3 +16.7	78.7	14 14.9 +17.8	78.9	14 26.3 +18.7	79.2	14 37.4 +19.8	79.5	14 48.4 +20.8	79.8	14 59.4 +21.8	79.8	14 69.4 +22.8	79.8	15		
16	13 26.9 +12.4	76.7	13 40.6 +13.4	77.0	13 54.0 +14.4	77.2	14 07.1 +15.4	77.5	14 20.0 +16.5	77.7	14 32.7 +17.4	78.0	14 45.0 +18.5	78.2	14 57.2 +19.4	78.5	15 09.2 +20.4	78.8	15 21.2 +21.4	78.8	15 33.2 +22.4	78.8	16		
17	13 39.3 +12.1	75.7	13 54.0 +13.1	76.0	14 08.4 +14.1	76.2	14 22.5 +15.2	76.5	14 36.5 +16.2	76.7	14 50.1 +17.2	77.0	15 03.5 +18.2	77.2	15 16.6 +19.3	77.5	15 29.6 +20.3	77.8	15 42.6 +21.3	77.8	15 55.6 +22.3	77.8	17		
18	13 51.4 +11.9	74.7	14 07.1 +12.9	75.0	14 22.5 +14.0	75.2	14 37.7 +15.0	75.5	14 52.7 +15.9	75.7	15 07.3 +17.0	76.0	15 21.7 +18.0	76.2	15 35.9 +18.9	76.5	15 49.9 +19.9	76.8	15 63.9 +20.9	76.8	15 77.9 +21.9	76.8	18		
19	14 03.3 +11.6	73.7	14 20.0 +12.7	74.0	14 36.5 +13.6	74.2	14 52.7 +14.6	74.5	15 08.6 +15.7	74.7	15 24.3 +16.7	75.0	15 39.7 +17.7	75.3	15 54.8 +18.7	75.5	16 10.2 +19.7	75.8	16 24.2 +20.7	76.0	16 38.2 +21.7	76.0	19		
20	14 14.9 +11.4	72.7	14 32.7 +12.3	73.0	14 50.1 +13.4	73.2	15 07.3 +14.4	73.5	15 24.3 +15.4	73.7	15 41.0 +16.4	74.0	15 57.4 +17.4	74.3	16 13.5 +18.4	74.5	16 31.9 +19.4	74.5	16 44.9 +20.4	74.5	16 57.9 +21.4	74.5	20		
21	14 26.3 +11.1	71.7	14 45.0 +12.2	71.9	15 03.5 +13.1	72.2	15 21.7 +14.2	72.5	15 39.7 +15.1	72.7	15 57.4 +16.1	73.0	16 14.8 +17.1	73.3	16 31.9 +18.2	73.5	16 45.1 +19.2	73.5	16 58.1 +20.2	73.5	16 71.1 +21.2	73.5	21		
22	14 37.4 +10.9	70.7	14 57.2 +11.8	70.9	15 16.6 +12.9	71.2	15 35.9 +13.8	71.4	15 54.8 +14.9	71.7	16 13.5 +15.9	72.0	16 31.9 +16.9	72.3	16 50.1 +17.8	72.6	16 67.4 +18.7	72.6	16 84.8 +19.7	72.6	16 98.2 +20.7	72.6	22		
23	14 48.3 +10.6	69.7	15 09.0 +11.6	69.9	15 29.5 +12.6	70.2	15 49.7 +13.6	70.4	16 09.7 +14.6	70.7	16 29.4 +15.5	71.0	16 48.8 +16.6	71.3	17 07.9 +17.6	71.6	17 25.7 +18.6	71.6	17 43.7 +19.6	71.6	17 59.7 +20.6	71.6	23		
24	14 58.9 +10.3	68.6	15 20.6 +11.3	68.9	15 42.1 +12.3	69.2	16 03.3 +13.3	69.5	16 24.3 +14.2	69.7	16 44.9 +15.3	70.0	17 05.4 +16.2	70.3	17 25.5 +17.2	70.6	17 45.2 +18.2	70.6	17 59.2 +19.2	70.6	17 73.2 +20.2	70.6	24		
25	15 09.2 +10.0	67.6	15 31.9 +11.0	67.9	15 54.4 +12.0	68.1	16 16.6 +13.0	68.4	16 38.5 +14.0	68.7	17 00.2 +15.0	69.0	17 21.6 +16.0	69.3	17 42.7 +17.0	69.5	17 59.9 +18.0	69.7	17 73.0 +19.0	69.7	17 86.9 +20.0	69.7	25		
26	15 19.2 +9.8	66.6	15 42.9 +10.8	66.9	16 06.4 +11.7	67.1	16 29.6 +12.7	67.4	16 52.5 +13.7	67.7	17 15.2 +14.7	67.9	17 37.6 +15.6	68.2	17 59.7 +16.6	68.5	18 16.3 +17.5	68.8	18 34.3 +18.5	69.1	18 48.8 +19.5	69.1	26		
27	15 29.0 +9.4	65.6	15 53.7 +10.4	65.8	16 18.1 +11.4	66.1	16 42.3 +12.4	66.4	17 06.2 +13.4	66.5	17 29.8 +14.3	66.7	17 53.2 +15.4	67.2	18 16.3 +16.3	67.5	18 34.0 +17.3	67.8	18 48.0 +18.3	67.8	18 62.0 +19.3	67.8	27		
28	15 38.4 +9.2	64.6	16 04.1 +10.2	64.8	16 29.5 +11.2	65.1	16 54.7 +12.1	65.3	17 19.6 +13.0	65.6	17 44.2 +14.0	65.9	18 08.6 +15.0	66.2	18 32.6 +16.0	66.5	18 46.6 +17.0	66.8	18 63.2 +18.0	66.8	18 80.6 +19.0	66.8	28		
29	15 47.6 +8.8	63.5	16 14.3 +9.8	63.8	16 40.7 +10.8	64.0	17 06.8 +11.8	64.3	17 32.6 +12.8	64.6	17 58.2 +13.8	64.9	18 23.6 +14.6	65.2	18 48.6 +15.6	65.5	19 08.6 +16.6	65.8	19 33.6 +17.6	66.1	19 49.6 +18.6	66.1	34		
30	15 56.5 +8.6	62.5	16 24.1 +9.6	62.8	16 51.5 +10.5	63.0	17 18.6 +11.4	63.3	17 45.4 +12.4	63.6	18 12.0 +13.4	63.9	18 38.2 +14.4	64.2	19 04.2 +15.4	64.5	19 34.2 +16.4	64.8	19 54.2 +17.4	64.8	19 74.2 +18.4	64.8	30		
31	16 05.1 +8.4	61.5	16 33.7 +9.2	61.7	17 02.0 +10.2	62.0	17 30.0 +11.2	62.3	17 57.8 +12.1	62.5	18 25.4 +13.0	62.8	18 52.6 +14.0	63.1	19 19.6 +14.9	63.5	19 34.5 +15.8	63.8	19 54.5 +16.8	63.8	19 73.5 +17.8	63.8	31		
32																									

LATITUDE CONTRARY NAME TO DECLINATION L.H.A. 80°, 280°

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.
	Hc	d	Z																						
0	9 39.4	-15.9	92.6	9 36.5	-16.8	92.8	9 33.5	-17.8	93.0	9 30.4	-18.9	93.1	9 27.0	-19.9	93.3	9 23.5	-20.9	93.5	9 19.8	-21.9	93.6	9 15.9	-22.8	93.8	0
1	9 23.5	-16.0	93.6	9 19.7	-17.0	93.8	9 15.7	-18.1	93.9	9 11.5	-19.1	94.1	9 07.1	-20.0	94.2	9 02.6	-21.0	94.4	8 57.9	-22.0	94.6	8 53.1	-23.0	94.7	1
2	9 07.5	-16.1	94.6	9 02.7	-17.2	94.7	8 57.6	-18.1	94.9	8 52.4	-19.1	95.0	8 47.1	-20.2	95.2	8 41.6	-21.2	95.3	8 35.9	-22.1	95.5	8 30.1	-23.1	95.6	2
3	8 51.4	-16.3	95.5	8 45.5	-17.3	95.7	8 39.5	-18.4	95.8	8 33.3	-19.3	96.0	8 26.9	-20.3	96.1	8 20.4	-21.3	96.3	8 13.8	-22.3	96.4	8 07.0	-23.3	96.6	3
4	8 35.1	-16.5	96.5	8 28.2	-17.5	96.7	8 21.1	-18.4	96.8	8 14.0	-19.5	97.0	8 06.6	-20.4	97.1	7 59.1	-21.4	97.2	7 51.5	-22.4	97.4	7 43.7	-23.4	97.5	4
5	8 18.6	-16.6	97.5	8 10.7	-17.6	97.6	8 02.7	-18.6	97.8	7 54.5	-19.6	97.9	7 46.2	-20.6	98.0	7 37.7	-21.5	98.2	7 29.1	-22.5	98.3	7 20.3	-23.4	98.4	5
6	8 02.0	-16.7	98.5	7 53.1	-17.7	98.6	7 44.1	-18.7	98.7	7 34.9	-19.7	98.9	7 25.6	-20.7	99.0	7 16.2	-21.7	99.1	7 06.6	-22.7	99.2	6 56.9	-23.6	99.4	6
7	7 45.3	-16.9	99.4	7 35.4	-17.8	99.6	7 25.4	-18.9	99.7	7 15.2	-19.8	99.8	7 04.9	-20.8	99.9	6 54.5	-21.8	100.1	6 43.9	-22.7	100.2	6 33.3	-23.7	100.3	7
8	7 28.4	-16.9	100.4	7 17.6	-18.0	100.5	7 06.5	-18.9	100.6	6 55.4	-20.0	100.8	6 44.1	-20.9	100.9	6 32.7	-21.9	101.0	6 21.2	-22.8	101.1	6 09.6	-23.8	101.2	8
9	7 11.5	-17.1	101.4	6 59.6	-18.1	101.5	6 47.6	-19.1	101.6	6 35.4	-20.0	101.7	6 23.2	-21.0	101.8	6 10.8	-21.9	101.9	5 58.4	-23.0	102.0	5 45.8	-23.9	102.1	9
10	6 54.4	-17.3	102.3	6 41.5	-18.2	102.4	6 28.5	-19.2	102.6	6 15.4	-20.2	102.7	6 02.2	-21.1	102.8	5 48.9	-22.1	102.9	5 35.4	-23.0	103.0	5 21.9	-23.9	103.1	10
11	6 37.1	-17.3	103.3	6 23.3	-18.3	103.4	6 09.3	-19.3	103.5	5 55.2	-20.2	103.6	5 41.1	-21.2	103.7	5 26.8	-22.2	103.8	5 12.4	-23.1	103.9	4 58.0	-24.1	104.0	11
12	6 19.8	-17.4	104.3	6 05.0	-18.4	104.4	5 50.0	-19.3	104.5	5 35.0	-20.3	104.6	5 19.9	-21.3	104.7	5 04.6	-22.2	104.7	4 49.3	-23.1	104.8	4 33.9	-24.1	104.9	12
13	6 02.4	-17.6	105.2	5 46.6	-18.6	105.3	5 30.7	-19.5	105.4	5 14.7	-20.5	105.5	4 58.6	-21.4	105.6	4 20.1	-22.4	106.6	4 02.9	-23.3	106.7	3 45.7	-24.3	106.7	14
14	5 44.8	-17.6	106.2	5 28.0	-18.6	106.3	5 11.2	-19.6	106.4	4 54.2	-20.5	106.5	4 37.2	-21.4	106.5	4 20.1	-22.4	106.6	3 08.5	-23.3	106.7	3 06.3	-24.3	106.7	15
15	5 27.2	-17.8	107.1	5 09.4	-18.6	107.2	4 51.6	-19.6	107.3	4 33.7	-20.5	107.4	4 15.8	-21.5	107.5	3 57.7	-22.4	107.6	3 39.6	-23.4	107.6	3 21.4	-24.2	107.7	15
16	5 09.4	-17.8	108.1	4 50.8	-18.8	108.2	4 32.0	-19.7	108.3	4 13.2	-20.7	108.3	3 54.3	-21.6	108.4	3 35.3	-22.5	108.5	3 16.2	-23.4	108.6	2 57.2	-24.4	108.6	16
17	4 51.6	-17.9	109.1	4 32.0	-18.8	109.1	4 12.3	-19.8	109.2	3 52.5	-20.7	109.3	3 32.7	-21.6	109.3	3 12.8	-22.6	109.4	2 52.8	-23.4	109.4	2 32.8	-24.3	109.5	17
18	4 33.7	-17.9	110.0	4 13.2	-18.9	110.1	3 52.5	-19.8	110.2	3 31.8	-20.7	110.2	3 11.1	-21.7	110.3	2 50.2	-22.6	110.3	2 29.4	-23.5	110.4	2 08.5	-24.4	110.4	18
19	4 15.8	-18.1	111.0	3 54.3	-19.8	111.0	3 32.7	-19.9	111.1	3 11.1	-20.9	111.2	2 49.4	-21.8	111.2	2 27.6	-22.6	111.2	2 05.9	-23.5	111.3	1 44.1	-24.4	111.3	19
20	3 57.7	-18.1	111.9	3 35.3	-19.1	112.0	3 12.8	-20.0	112.0	2 50.2	-20.8	112.1	2 27.6	-21.7	112.1	2 05.0	-22.6	112.2	1 42.4	-23.6	112.2	1 19.7	-24.5	112.2	20
21	3 39.6	-18.2	112.9	3 16.2	-19.0	112.9	2 52.8	-20.0	113.0	2 29.4	-20.9	113.0	2 05.9	-21.8	113.1	1 42.4	-22.7	113.1	1 18.8	-23.6	113.1	0 55.2	-24.4	113.1	21
22	3 21.4	-18.2	113.8	2 57.2	-19.2	113.9	2 32.8	-20.0	113.9	2 08.5	-21.0	114.0	1 44.1	-21.8	114.0	1 19.7	-22.7	114.0	0 55.2	-23.6	114.0	0 30.8	-24.5	114.1	22
23	3 03.2	-18.3	114.8	2 38.0	-19.2	114.8	2 12.8	-20.1	114.9	1 47.5	-20.9	114.9	1 22.3	-21.9	114.9	0 57.0	-22.8	115.0	0 31.6	-23.6	115.0	0 06.3	-24.5	115.0	23
24	2 44.9	-18.3	115.7	2 18.8	-19.2	115.8	1 52.7	-20.1	115.8	1 26.6	-21.0	115.8	1 00.4	-21.9	115.9	0 34.2	-22.7	115.9	0 18.2	+24.4	115.9	0 42.6	+24.5	115.9	24
25	2 26.6	-18.4	116.7	1 59.6	-19.2	116.7	1 32.6	-20.1	116.8	1 05.6	-21.0	116.8	0 38.5	-21.8	116.8	0 11.5	-22.7	116.8	0 15.6	+23.6	116.8	0 42.6	+24.5	116.8	25
26	2 08.2	-18.4	117.7	1 40.4	-19.3	117.7	1 12.5	-20.2	117.7	0 44.6	-21.0	117.7	0 16.7	-21.9	117.7	0 0.2	+21.9	117.7	0 11.2	+22.8	117.7	0 39.2	+23.5	117.7	26
27	1 49.8	-18.4	118.6	1 21.1	-19.3	118.6	0 52.3	-20.1	118.6	0 23.6	-21.0	118.7	0 0.52	+21.9	61.3	0 34.0	+22.7	61.3	1 02.7	+23.6	61.4	1 31.5	+24.4	61.4	27
28	1 31.4	-18.4	119.6	1 01.8	-19.3	119.6	0 32.2	-20.2	119.6	0 0.26	-21.1	119.6	0 12.0	-20.2	120.5	0 18.5	+21.0	59.5	0 48.9	+21.9	59.5	1 49.9	+23.5	59.5	29
29	1 13.0	-18.5	120.5	0 42.5	-19.3	120.5	0 15.5	+19.3	56.6	0 08.2	+20.1	58.5	0 39.5	+21.0	58.5	1 10.8	+21.8	58.5	1 42.1	+22.7	58.6	2 44.6	+24.3	58.6	30
30	0 54.5	-18.5	121.5	0 23.2	-19.4	121.5	0 28.3	+20.2	57.6	0 48.5	+20.1	57.6	1 21.5	+20.9	56.7	1 54.4	+21.8	56.7	2 27.6	+22.6	56.7	3 03.0	+23.4	56.8	32
31	0 36.0	-18.5	122.4	0 03.8	-19.3	122.4	0 48.5	+20.1	56.6	0 28.3	+20.1	56.6	1 21.5	+20.9	56.7	1 56.7	+21.8	56.7	2 23.6	+24.4	56.7	3 08.9	+24.3	57.7	31
32	0 17.5	-18.5	123.4	0 15.5	+19.3	56.6	0 34.8	+19.3	55.7	1 08.6	+20.2	55.7	2 14.4	+21.0	55.7	2 56.7	+22.7	55.7	3 15.5	+23.4	55.7	3 57.4	+24.1	55.7	33
33	0 01.0	+18.5	55.7	0 34.8	+19.3	55.7	1 28.8	+20.1	54.8	2 03.4	+20.9	54.8	2 38.0	+21.7	54.8	3 12.5	+22.5	54.9	3 47.0	+23.3	54.9	4 21.5	+24.1	55.0	34
34	0 19.5	+18.5	54.7	0 54.1	+19.4	54.7	1 28.8	+20.1	54.8	2 03.4	+20.9	54.8	2 38.0	+21.7	54.8	3 12.5	+22.5	54.9	3 47.0	+23.3	54.9	4 21.5	+24.1	55.0	34
35	0 38.0	+18.5	53.8	1 13.5	+19.2	53.8	1 48.9	+20.1	53.8	2 24.3	+20.9	53.8	2 59.7	+21.6	53.9	3 35.0	+22.5	53.9	4 10.3	+23.3	54.0	4 45.6	+24.0	54.0	35
36	0 56.5	+18.5	52.8	1 32.7	+19.3	52.8	2 09.0	+20.0	52.9	2 45.2	+20.8	52.9	3 21.3	+21.6	52.9	3 57.5	+22.3	53.0	4 33.6	+23.1	53.1	5 09.6	+23.9	53.1	36
37	1 15.0	+18.4	51.9	1 52.0	+19.2	51.9	2 29.0	+20.0	51.9	3 06.0	+19.8	52.0	3 42.9	+21.6	52.0	4 19.8	+22.4	52.1	5 56.7	+23.1	52.1	5 33.5	+23.8	52.2	37
38	1 33.4	+18.4	50.9	2 11.2	+19.2	51.0	2 49.0	+20.0	51.0	3 26.8	+20.7	51													

81°, 279° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180°Zn=7
L.H.A. less than 180°Zn=360°-Z

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.		
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z			
0	8 41.5 +15.6	92.3	8 38.9 +16.7	92.5	8 36.2 +17.7	92.7	8 33.4 +18.6	92.8	8 30.4 +19.6	93.0	8 27.2 +20.7	93.1	8 23.9 +21.6	93.2	8 20.4 +22.6	93.4	8 17.0 +23.6	93.5	8 14.0 +24.6	93.6	8 10.9 +25.6	93.7	8 7.9 +26.6	93.8	0		
1	8 57.1 +15.5	91.4	8 55.6 +16.5	91.5	8 53.9 +17.5	91.7	8 52.0 +18.6	91.8	8 50.0 +19.6	92.0	8 47.9 +20.5	92.2	8 45.5 +21.6	92.3	8 43.0 +22.5	92.5	8 40.5 +23.4	92.6	8 38.0 +24.3	92.7	8 35.5 +25.2	92.8	8 33.0 +26.1	92.9	8 30.5 +27.0	93.0	1
2	9 12.6 +15.3	90.4	9 12.1 +16.3	90.6	9 11.4 +17.4	90.7	9 10.6 +18.4	90.9	9 0.96 +19.4	91.0	9 08.4 +20.4	91.2	9 07.1 +21.3	91.4	9 05.5 +22.4	91.5	9 03.0 +23.3	91.6	9 00.5 +24.2	91.7	8 58.0 +25.1	91.8	8 55.0 +26.0	91.9	8 52.0 +26.9	92.0	2
3	9 27.9 +15.1	89.4	9 28.4 +16.2	89.6	9 28.8 +17.2	89.7	9 29.0 +18.2	89.9	9 29.0 +19.2	90.1	9 28.8 +20.2	90.2	9 28.4 +21.3	90.4	9 27.9 +22.2	90.6	9 26.4 +23.1	90.7	9 25.0 +24.0	90.8	9 23.5 +24.9	90.9	9 22.0 +25.8	91.0	9 20.5 +26.7	91.1	3
4	9 43.0 +15.0	88.4	9 44.6 +16.0	88.6	9 46.0 +17.0	88.8	9 47.2 +18.0	88.9	9 48.2 +19.0	89.1	9 49.0 +20.1	89.3	9 49.7 +21.0	89.5	9 50.1 +22.1	89.6	9 50.5 +23.0	89.7	9 50.9 +23.9	89.8	9 51.3 +24.8	89.9	9 51.7 +25.7	90.0	9 52.1 +26.6	90.1	4
5	9 58.0 +14.9	87.4	10 00.6 +15.9	87.6	10 03.0 +16.9	87.8	10 05.2 +17.9	88.0	10 07.2 +18.9	88.2	10 09.1 +19.9	88.3	10 10.7 +20.9	88.5	10 12.2 +21.9	88.7	10 13.7 +22.9	88.8	10 15.2 +23.9	88.9	10 16.7 +24.9	89.0	10 18.2 +25.9	89.1	10 19.7 +26.9	89.2	5
6	10 12.9 +14.6	86.5	10 16.5 +15.6	86.6	10 19.9 +16.7	86.8	10 23.1 +17.7	87.0	10 26.1 +18.8	87.2	10 29.0 +19.7	87.4	10 31.6 +20.8	87.6	10 34.1 +21.7	87.7	10 36.6 +22.6	87.8	10 39.1 +23.6	87.9	10 41.6 +24.6	88.0	10 44.1 +25.6	88.1	10 46.6 +26.6	88.2	6
7	10 27.5 +14.5	85.5	10 32.1 +15.5	85.7	10 36.6 +16.5	85.8	10 40.8 +17.5	86.0	10 44.9 +18.5	86.2	10 48.7 +19.6	86.4	10 52.4 +20.5	86.6	10 55.8 +21.6	86.8	10 59.1 +22.6	87.0	10 62.4 +23.6	87.2	10 65.7 +24.6	87.4	10 69.0 +25.6	87.6	7		
8	10 42.0 +14.2	84.5	10 47.6 +15.3	84.7	10 53.1 +16.3	84.9	10 58.3 +17.4	85.1	11 03.4 +18.4	85.3	11 08.3 +19.3	85.5	11 12.9 +20.4	85.6	11 17.4 +21.3	85.8	11 21.9 +22.3	86.0	11 26.4 +23.3	86.2	11 30.9 +24.3	86.4	11 35.4 +25.3	86.6	8		
9	10 56.2 +14.1	83.5	11 02.9 +15.1	83.7	11 09.4 +16.1	83.9	11 15.7 +17.1	84.1	11 21.8 +18.1	84.3	11 27.6 +19.2	84.5	11 33.3 +20.2	84.7	11 38.7 +21.2	84.9	11 43.1 +22.2	85.1	11 47.5 +23.2	85.3	11 51.9 +24.2	85.5	11 56.3 +25.2	85.7	9		
10	11 10.3 +13.9	82.5	11 18.0 +14.9	82.7	11 25.5 +16.0	82.9	11 32.8 +17.0	83.1	11 39.9 +18.0	83.3	11 46.8 +19.0	83.5	11 53.5 +20.0	83.7	11 59.9 +21.0	83.9	12 05.5 +22.0	84.1	12 12.2 +23.0	84.3	12 18.9 +24.0	84.5	12 25.6 +25.0	84.7	10		
11	11 24.2 +13.7	81.5	11 32.9 +14.8	81.7	11 41.5 +15.7	81.9	11 49.8 +16.8	82.1	11 57.9 +17.8	82.3	12 05.8 +18.8	82.6	12 13.5 +19.7	82.8	12 20.9 +20.8	83.0	12 28.4 +21.8	83.2	12 36.1 +22.8	83.4	12 43.7 +23.8	83.6	12 51.4 +24.8	83.8	11		
12	11 37.9 +13.5	80.5	11 47.7 +14.5	80.7	11 57.2 +15.5	80.9	12 06.6 +16.5	81.1	12 15.7 +17.5	81.4	12 24.6 +18.5	81.6	12 33.2 +19.6	81.8	12 41.7 +20.6	82.0	12 49.7 +21.6	82.2	12 57.7 +22.6	82.4	12 65.7 +23.6	82.6	12				
13	11 51.4 +13.2	79.5	12 02.2 +14.3	79.7	12 12.7 +15.4	80.0	12 23.1 +16.3	80.2	12 33.2 +17.4	80.4	12 43.1 +18.4	80.6	12 52.8 +19.4	80.8	13 02.3 +20.3	81.1	13 10.2 +21.3	81.3	13 18.7 +22.3	81.5	13 27.2 +23.3	81.7	13				
14	12 04.6 +13.1	78.5	12 16.5 +14.0	78.7	12 28.1 +15.1	79.0	12 39.4 +16.1	79.2	12 50.6 +17.1	79.4	13 01.5 +18.1	79.6	13 12.2 +19.1	79.9	13 22.6 +20.2	80.1	13 32.1 +21.2	80.3	13 41.8 +22.2	80.5	13 51.5 +23.2	80.7	14				
15	12 17.7 +12.8	77.5	12 30.5 +13.9	77.7	12 43.2 +14.8	78.0	12 55.5 +15.9	78.2	13 07.7 +16.9	78.4	13 19.6 +17.9	78.6	13 31.3 +18.9	78.8	13 42.8 +19.9	79.1	13 54.5 +20.9	79.4	13 66.5 +21.9	79.7	13 78.5 +22.9	79.9	15				
16	12 30.5 +12.7	76.5	12 44.4 +13.6	76.8	12 58.0 +14.5	77.0	13 11.4 +15.7	77.2	13 24.6 +16.7	77.4	13 37.5 +17.7	77.7	13 50.2 +18.7	77.9	14 02.7 +19.7	78.1	14 15.7 +20.7	78.3	14 28.6 +21.7	78.5	14 41.6 +22.7	78.7	16				
17	12 43.2 +12.3	75.5	12 58.0 +13.4	75.8	13 12.7 +14.4	76.0	13 27.1 +15.4	76.2	13 41.3 +16.4	76.4	13 55.2 +17.5	76.7	14 08.9 +18.5	76.9	14 22.4 +19.4	77.2	14 36.2 +20.4	77.4	14 49.1 +21.4	77.6	14 62.0 +22.4	77.8	17				
18	12 55.5 +12.2	74.5	13 11.4 +13.2	74.8	13 27.1 +14.2	75.0	13 42.5 +15.2	75.2	13 57.7 +16.2	75.5	14 12.7 +17.2	75.7	14 27.4 +18.2	75.9	14 41.8 +19.2	76.2	14 55.2 +20.2	76.4	15 08.0 +21.2	76.6	15 21.8 +22.2	76.8	18				
19	13 07.7 +11.8	73.5	13 24.6 +12.9	73.8	13 41.3 +13.9	74.0	13 57.7 +15.0	74.2	14 13.9 +16.0	74.5	14 29.9 +16.9	74.7	14 45.6 +17.9	75.0	15 01.0 +18.9	75.2	15 17.1 +19.9	75.4	15 33.1 +20.9	75.6	15 50.1 +21.9	75.8	19				
20	13 19.6 +11.7	72.5	13 37.5 +12.7	72.7	13 55.2 +13.7	73.0	14 12.7 +14.7	73.2	14 29.9 +15.7	73.5	14 46.8 +16.7	73.7	15 03.5 +17.7	74.0	15 19.9 +18.7	74.2	15 36.4 +19.7	74.5	15 53.8 +20.7	74.7	16 11.2 +21.7	74.9	16 28.6 +22.7	75.1	20		
21	13 31.3 +11.5	71.5	13 50.2 +12.5	71.7	14 08.9 +13.5	72.0	14 27.4 +14.4	72.2	14 45.6 +15.4	72.5	15 03.5 +16.4	72.7	15 21.2 +17.4	73.0	15 38.6 +18.4	73.2	15 55.4 +19.4	73.4	16 12.4 +20.4	73.6	16 29.4 +21.4	73.8	16 46.4 +22.4	74.0	21		
22	13 42.8 +11.2	70.5	14 02.7 +12.2	70.7	14 22.4 +13.2	71.0	14 41.8 +14.2	71.2	15 01.0 +15.2	71.5	15 19.9 +16.2	71.7	15 38.6 +17.2	72.0	15 57.0 +18.2	72.3	15 75.4 +19.2	72.5	15 93.8 +20.2	72.7	15 11.8 +21.2	72.9	15 29.2 +22.2	73.1	22		
23	13 54.0 +10.9	69.5	14 14.9 +11.9	69.7	14 35.6 +12.9	70.0	14 56.0 +13.9	70.2	15 16.2 +14.9	70.5	15 36.1 +15.9	70.7	15 55.8 +16.9	71.0	16 15.2 +17.9	71.3	16 33.1 +18.9	71.5	16 51.1 +19.9	71.7	16 69.1 +20.9	71.9	16 87.1 +21.9	72.1	23		
24	14 04.9 +10.7	68.5	14 26.8 +11.7	68.7	14 48.5 +12.7	69.0	15 09.9 +13.7	69.2	15 31.1 +14.6	69.5	15 52.0 +15.6	69.7	16 12.7 +16.6	70.0	16 33.1 +17.6	70.3	16 51.1 +18.6	70.5	16 69.1 +19.6	70.7	16 87.1 +20.6	70.9	16 10.7 +21.6	71.1	24		
25	14 56.0 +10.5	67.5	14 38.5 +11.4	67.7	15 01.2 +12.4	67.9	15 23.6 +13.3	68.2	15 45.7 +14.4	68.5	16 07.6 +15.4	68.7	16 29.3 +16.3	69.0	16 50.7 +17.3	69.2	16 68.7 +18.3	69.4	16 86.7 +19.3	69.6	16 10.7 +20.3	69.8	16 28.7 +21.3	70.0	25		
26	14 26.1 +10.1	66.4	14 49.9 +11.2	66.7	15 13.6 +12.1	66.9	15 36.9 +13.1	67.2	16 00.1 +14.1	67.4	16 23.0 +15.0	67.7	16 45.6 +16.0	68.0	16 70.9 +17.0	68.3	16 87.9 +18.0	68.6	16 10.7 +19.0	68.9	16 28.4 +19.9	69.1	16 46.3 +20.9	69.4	26		
27	14 36.2 +9.9	65.4	15 01.1 +10.9	65.7	15 25.7 +11.8	65.9	15 50.0 +12.9	66.2	16 14.2 +13.7	66.4	16 38.0 +14.8	66.7	17 01.6 +15.7	67.0	17 24.9 +16.7	67.3	17 44.6 +17.7	67.6	17 64.3 +18.7	67.9	17 84.0 +19.7	68.2	17 10.1 +20.7	68.5	27		
28	14 46.1 +9.7	64.4	16 45.0 +7.7	54.4	17 19.8 +8.6	54.6	17 54.5 +9.4	54.9	18 28.9 +10.3	55.1	19 03.0 +11.2	55.3	19 30.0 +12.1	55.5	19 37.0 +13.0	55.7	19 44.1 +13.9	55.9	19 51.1 +14.8	56.1	19 58.1 +15.7	56.3	19 65.1 +16.6	56.5	28		
29	14 55.8 +9.4	53.3	16 22.7 +7.3	53.3	17 28.4 +8.2	53.6	18 03.9 +9.1	53.8	18 39.2 +10.7	54.0	19 2.7 +11.7	54.1	20 02.7 +12.6	54.3	20 13.8 +13.5	54.5	20 21.8 +14.3	54.7	21 29.2 +15.3	54.9	21						

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 81° , 279°

S. Lat. { L.H.A. greater than 180° $Zn=180^{\circ}-Z$
 { L.H.A. less than 180° $Zn=180^{\circ}+Z$

LATITUDE SAME NAME AS DECLINATION

L.H.A. 99° , 261°

82°, 278° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180°Zn=7
L.H.A. less than 180°Zn=360°-Z

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	
0	7 43.5 +15.6	92.1	7 41.3 +16.6	92.2	7 38.9 +17.6	92.4	7 36.4 +18.6	92.5	7 33.7 +19.6	92.6	7 30.9 +20.6	92.8	7 27.9 +21.7	92.9	7 24.8 +22.7	93.0	7 21.7 +23.7	93.1	7 18.6 +24.7	93.2	7 15.5 +25.7	93.3	7 12.4 +26.7	93.4	0
1	7 59.1 +15.5	91.1	7 57.9 +16.5	91.2	7 56.5 +17.5	91.4	7 55.0 +18.5	91.5	7 53.3 +19.5	91.7	7 51.5 +20.5	91.8	7 49.6 +21.5	91.9	7 47.5 +22.4	92.1	7 45.4 +23.4	92.2	7 43.3 +24.4	92.3	7 41.2 +25.4	92.4	7 39.1 +26.4	92.5	1
2	8 14.6 +15.3	90.1	8 14.4 +16.3	90.3	8 14.0 +17.4	90.4	8 13.5 +18.4	90.6	8 12.8 +19.4	90.7	8 12.0 +20.4	90.9	8 11.1 +21.3	91.0	8 09.9 +22.4	91.1	8 08.7 +23.4	91.2	8 07.5 +24.4	91.3	8 06.3 +25.4	91.4	8 05.1 +26.4	91.5	2
3	8 29.9 +15.2	89.2	8 30.7 +16.2	89.3	8 31.4 +17.2	89.5	8 31.9 +18.2	89.6	8 32.2 +19.3	89.8	8 32.4 +20.2	89.9	8 32.4 +21.3	90.1	8 32.3 +22.2	90.2	8 32.2 +23.2	90.3	8 32.1 +24.2	90.4	8 32.0 +25.2	90.5	8 31.9 +26.2	90.6	3
4	8 45.1 +15.0	88.2	8 46.9 +16.1	88.3	8 48.6 +17.1	88.5	8 50.1 +18.1	88.6	8 51.5 +19.1	88.8	8 52.6 +20.1	89.0	8 53.7 +21.0	89.1	8 54.5 +22.1	89.3	8 55.3 +23.1	89.4	8 56.1 +24.1	89.5	8 57.0 +25.1	89.6	8 57.9 +26.1	89.7	4
5	9 00.1 +14.9	87.2	9 03.0 +15.9	87.4	9 05.7 +16.9	87.5	9 08.2 +17.9	87.7	9 10.6 +18.9	87.8	9 12.7 +20.0	88.0	9 14.7 +21.0	88.2	9 16.6 +21.9	88.3	9 18.5 +22.8	88.4	9 20.4 +23.7	88.5	9 22.3 +24.6	88.6	9 24.2 +25.5	88.7	5
6	9 15.0 +14.7	86.2	9 18.9 +15.7	86.4	9 22.6 +16.8	86.5	9 26.1 +17.8	86.7	9 29.5 +18.8	86.9	9 32.7 +19.8	87.0	9 35.7 +20.8	87.2	9 38.5 +21.8	87.4	9 41.3 +22.7	87.6	9 44.1 +23.6	87.8	9 47.0 +24.5	87.9	9 50.0 +25.4	88.1	6
7	9 29.7 +14.6	85.2	9 34.6 +15.6	85.4	9 39.4 +16.5	85.6	9 43.9 +17.6	85.7	9 48.3 +18.6	85.9	9 52.5 +19.6	86.1	9 56.5 +20.6	86.3	10 00.3 +21.6	86.4	10 03.1 +22.5	86.5	10 05.9 +23.4	86.6	10 08.7 +24.3	86.7	10 11.5 +25.2	86.8	7
8	9 44.3 +14.4	84.2	9 50.2 +15.4	84.4	9 55.9 +16.5	84.6	10 01.5 +17.4	84.8	10 06.9 +18.4	84.9	10 12.1 +19.4	85.1	10 17.1 +20.4	85.3	10 21.9 +21.4	85.5	10 26.7 +22.4	85.6	10 31.5 +23.4	85.7	10 36.3 +24.3	85.8	10 41.1 +25.2	85.9	8
9	9 58.7 +14.2	83.3	10 05.6 +15.2	83.4	10 12.4 +16.2	83.6	10 18.9 +17.3	83.8	10 25.3 +18.3	84.0	10 31.5 +19.3	84.2	10 37.5 +20.3	84.3	10 43.3 +21.3	84.5	10 49.1 +22.2	84.6	10 54.9 +23.1	84.7	10 59.7 +24.1	84.8	10 64.5 +25.0	84.9	9
10	10 12.9 +14.0	82.3	10 20.8 +15.1	82.5	10 28.6 +16.1	82.6	10 36.2 +17.1	82.8	10 43.6 +18.1	83.0	10 50.8 +19.1	83.2	10 57.8 +20.1	83.4	11 04.6 +21.1	83.6	11 11.4 +22.1	83.8	11 18.2 +23.1	83.9	11 25.0 +24.1	84.0	11 31.8 +25.0	84.1	10
11	10 26.9 +13.8	81.3	10 35.9 +14.8	81.5	10 44.7 +15.9	81.7	10 53.3 +16.9	81.8	11 01.7 +17.9	82.0	11 09.9 +18.9	82.2	11 17.9 +19.9	82.4	11 25.7 +20.9	82.6	11 33.5 +21.8	82.8	11 41.3 +22.7	83.0	11 49.1 +23.6	83.2	11 56.9 +24.5	83.4	11
12	10 40.7 +13.7	80.3	10 50.7 +14.7	80.5	11 00.6 +15.7	80.7	11 10.2 +16.7	80.9	11 19.6 +17.7	81.1	11 28.8 +18.7	81.3	11 37.8 +19.7	81.5	11 46.6 +20.7	81.7	11 55.4 +21.6	81.9	12 04.2 +22.5	82.1	12 13.0 +23.4	82.3	12 21.8 +24.3	82.5	12
13	10 54.4 +13.5	79.3	11 05.4 +14.5	79.5	11 16.3 +15.5	79.7	11 26.9 +16.5	79.9	11 37.3 +17.5	80.1	11 47.5 +18.6	80.3	11 57.5 +19.6	80.5	12 07.3 +20.6	80.7	12 16.1 +21.5	80.9	12 25.9 +22.4	81.1	12 34.7 +23.3	81.3	12 43.5 +24.2	81.5	13
14	11 07.9 +13.2	78.3	11 19.9 +14.3	78.5	11 31.8 +15.3	78.7	11 43.4 +16.3	78.9	11 54.8 +17.4	79.1	12 06.1 +18.3	79.3	12 17.1 +19.3	79.5	12 27.9 +20.3	79.8	12 37.7 +21.2	80.0	12 47.5 +22.1	80.2	12 57.3 +23.0	80.4	12 67.1 +23.9	80.6	14
15	11 21.1 +13.1	77.3	11 34.2 +14.1	77.5	11 47.1 +15.1	77.7	11 59.7 +16.1	77.9	12 12.2 +17.1	78.1	12 24.4 +18.1	78.3	12 36.4 +19.1	78.6	12 48.2 +20.1	78.8	12 58.7 +21.1	79.0	13 08.5 +22.0	79.2	13 18.3 +23.0	79.4	13 28.1 +24.0	79.6	15
16	11 34.2 +12.9	76.3	11 48.3 +13.9	76.5	12 02.2 +14.8	76.7	12 15.8 +15.9	76.9	12 29.3 +16.9	77.2	12 42.5 +17.9	77.4	12 55.5 +18.9	77.6	13 08.3 +19.9	77.8	13 18.1 +20.8	78.0	13 28.0 +21.7	78.2	13 37.8 +22.6	78.4	13 47.6 +23.5	78.6	16
17	11 47.1 +12.6	75.3	12 02.2 +13.6	75.5	12 17.0 +14.7	75.7	12 31.7 +15.7	76.0	12 46.2 +16.6	76.2	13 00.4 +17.7	76.4	13 14.4 +18.7	76.6	13 28.2 +19.6	76.9	13 37.0 +20.5	77.1	13 46.8 +21.4	77.3	13 56.6 +22.3	77.5	13 66.4 +23.2	77.7	17
18	11 59.7 +12.5	74.3	12 15.8 +13.5	74.5	12 31.7 +14.5	74.7	12 47.4 +15.4	75.0	13 02.8 +16.5	75.2	13 18.1 +17.4	75.4	13 33.1 +18.4	75.6	13 47.8 +19.3	75.9	14 06.7 +20.2	76.1	14 16.5 +21.1	76.3	14 26.3 +22.0	76.5	14 36.1 +22.9	76.7	18
19	12 12.2 +12.2	73.3	12 29.3 +13.2	73.5	12 46.2 +14.2	73.8	13 02.8 +15.3	74.0	13 19.3 +16.3	74.2	13 35.5 +17.2	74.4	13 51.5 +18.2	74.7	14 07.3 +19.1	74.9	14 22.1 +19.0	75.1	14 38.1 +19.9	75.3	14 54.0 +20.8	75.5	14 69.9 +21.7	75.7	19
20	12 24.4 +12.0	72.3	12 42.5 +13.0	72.5	13 00.4 +14.0	72.8	13 18.1 +15.0	73.0	13 35.5 +16.0	73.2	13 52.7 +17.0	73.4	14 09.7 +18.0	73.7	14 26.4 +19.0	73.9	14 45.4 +20.0	74.1	14 54.4 +21.0	74.3	14 63.4 +22.0	74.5	14 72.4 +23.0	74.7	20
21	12 36.4 +11.8	71.3	12 55.5 +12.8	71.5	13 14.4 +13.8	71.8	13 33.1 +14.7	72.0	13 51.5 +15.8	72.2	14 09.7 +16.7	72.5	14 27.7 +17.7	72.7	14 45.4 +18.7	72.9	14 54.4 +19.6	73.1	14 63.4 +20.5	73.3	14 72.4 +21.4	73.5	14 81.3 +22.3	73.7	21
22	12 48.2 +11.5	70.3	13 08.3 +12.5	70.5	13 28.2 +13.5	70.8	13 47.8 +14.5	71.0	14 07.3 +15.5	71.2	14 26.4 +16.5	71.5	14 45.4 +17.5	71.7	15 04.1 +18.5	72.0	15 22.6 +19.1	72.3	15 32.4 +20.0	72.6	15 42.2 +20.9	72.8	15 52.0 +21.8	73.0	22
23	12 59.7 +11.3	69.3	13 20.8 +12.3	69.5	13 41.7 +13.3	69.8	14 02.3 +14.3	70.0	14 22.8 +15.2	70.2	14 42.9 +16.3	70.5	15 02.9 +17.2	70.7	15 22.6 +18.1	71.0	15 32.4 +18.9	71.3	15 42.2 +19.8	71.5	15 52.0 +20.7	71.7	15 61.8 +21.6	71.9	23
24	13 11.0 +11.1	68.3	13 33.1 +12.1	68.5	14 19.9 +11.0	68.4	14 45.6 +12.0	68.7	15 11.1 +13.0	69.5	15 36.4 +13.9	69.5	16 01.4 +14.9	69.5	16 26.2 +15.9	69.5	16 50.8 +16.8	69.6	16 59.6 +17.7	69.7	16 68.4 +18.6	69.8	16 77.2 +19.5	69.9	24
25	13 22.1 +10.9	67.3	14 45.2 +11.8	67.5	14 08.0 +12.8	67.7	14 30.6 +13.8	68.0	14 53.0 +14.7	68.2	15 15.1 +15.7	68.5	15 37.0 +16.7	68.8	15 58.7 +17.6	69.0	16 17.5 +18.5	69.3	16 37.3 +19.4	69.6	16 57.1 +20.3	69.8	17 06.9 +21.1	70.0	25
26	13 33.0 +10.6	66.3	15 57.0 +11.6	66.5	14 20.8 +12.5	66.7	14 44.4 +13.5	67.0	15 07.7 +14.5	67.2	15 30.8 +15.5	67.5	15 53.7 +16.4	67.7	16 16.3 +17.4	68.0	16 33.7 +18.3	68.3	16 53.7 +19.2	68.6	17 04.1 +20.1	68.9	17 23.9 +21.0	69.2	26
27	13 43.6 +10.3	65.3	14 08.6 +11.3	65.5	16 23.7 +12.3	65.7	14 57.5 +13.2	66.0	15 22.2 +14.2	66.2	15 46.3 +15.1	66.5	16 10.1 +16.1	66.7	16 33.7 +17.1	67.0	17 0.7 +13.9	67.6	17 17.7 +18.6	67.9	17 37.7 +19.5	68.2	17 47.5 +20.4	68.5	27
28	13 53.9 +10.1	64.3	15 58.2 +8.2	54.3	16 33.1 +9.1	54.5	17 07.8 +10.1	54.7	17 42.4 +10.9	55.0	18 16.7 +11.7	55.3	19 50.7 +12.7	54.3	19 28.4 +13.5	54.0	18 28.4 +11.5	54.2	19 03.4 +12.3	54.5	19 38.1 +13.2	54.8	19 58.1 +14.0	54.9	39
29	14 0.4 +8.9	54.1	16 40.4 +7.1	47.0	17 30.5 +6.9	47.2	18 11.2 +7.7	47.5	18 51.6 +8.5	47.7	19 39.4 +8.0	48.0	20 11.9 +10.2	48.3	20 51.8 +10.9	48.5	20 22.1 +10.6	47.5	21 02						

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 82°, 278°

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.				
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z					
0	7 43.5 -15.7	92.1	7 41.3 -16.8	92.2	7 38.9 -17.8	92.4	7 36.4 -18.8	92.5	7 33.7 -19.8	92.6	7 30.9 -20.8	92.8	7 27.9 -21.7	92.9	7 24.8 -22.7	93.0	7 21.7 -23.7	93.1	7 18.6 -24.7	93.2	7 15.5 -25.7	93.3	7 12.4 -26.7	93.4	0				
1	7 27.8 -15.9	93.1	7 24.5 -16.8	93.2	7 21.1 -17.9	93.3	7 17.6 -18.9	93.4	7 13.9 -19.9	93.6	7 10.1 -20.9	93.7	7 06.2 -21.9	93.8	7 02.1 -22.8	93.9	7 01.1 -23.8	94.0	6 39.3 -23.0	94.9	6 36.3 -23.9	95.8	6 33.3 -24.8	95.7	6 16.3 -23.0	95.8	3		
2	7 11.9 -15.9	94.0	7 07.7 -17.0	94.2	7 03.2 -18.0	94.3	6 58.7 -19.0	94.4	6 54.0 -20.0	94.5	6 49.2 -20.9	94.6	6 44.3 -21.9	94.8	6 39.3 -23.0	94.9	6 36.3 -23.9	95.8	6 33.3 -24.8	95.7	6 30.3 -23.0	95.7	6 27.4 -23.9	95.6	6 22.4 -22.1	96.6	5 53.3 -23.1	96.7	4
3	6 56.0 -16.2	95.0	6 50.7 -17.2	95.1	6 45.2 -18.1	95.2	6 39.7 -19.1	95.4	6 34.0 -20.1	95.5	6 28.3 -21.1	95.6	6 22.4 -22.1	95.7	6 00.3 -22.2	96.6	5 53.3 -23.1	96.7	5 30.2 -23.2	97.7	5 27.9 -23.2	97.6	5 24.8 -22.7	93.0	5 21.7 -23.7	93.0	5		
4	6 39.8 -16.2	96.0	6 33.5 -17.2	96.1	6 27.1 -18.2	96.2	6 20.6 -19.2	96.3	6 13.9 -20.2	96.4	6 07.2 -21.2	96.5	6 00.3 -22.2	96.6	5 53.3 -23.1	96.7	5 30.2 -23.2	97.7	5 27.9 -23.2	97.6	5 24.8 -22.7	93.0	5 21.7 -23.7	93.0	5				
5	6 23.6 -16.3	96.9	6 16.3 -17.3	97.0	6 08.9 -18.3	97.2	6 01.4 -19.3	97.3	5 53.7 -20.3	97.4	5 46.0 -21.3	97.5	5 38.1 -22.2	97.6	5 30.2 -23.2	97.7	5 27.9 -23.2	97.6	5 24.8 -22.7	93.0	5 21.7 -23.7	93.0	5 18.6 -24.6	93.1	5 15.5 -25.6	93.2	0		
6	6 07.3 -16.4	97.9	5 59.0 -17.4	98.0	5 50.6 -18.4	98.1	5 42.1 -19.5	98.2	5 33.4 -20.4	98.3	5 27.4 -21.4	98.4	5 15.9 -22.3	98.5	5 07.0 -23.3	98.6	5 04.8 -24.3	98.7	4 43.7 -23.4	99.5	4 30.8 -23.6	99.4	4 27.7 -24.6	99.3	4 24.6 -23.6	99.2	2		
7	5 50.9 -16.6	98.9	5 41.6 -17.6	99.0	5 32.2 -18.6	99.1	5 22.6 -19.5	99.2	5 13.0 -20.4	99.3	5 03.3 -21.4	99.3	4 53.6 -22.5	99.4	4 40.9 -23.4	99.5	4 20.3 -23.4	100.4	4 17.1 -24.4	100.3	4 14.0 -23.4	100.2	4 11.9 -24.4	100.1	4 8.8 -25.4	100.0	8		
8	5 34.3 -16.6	99.8	5 24.0 -17.6	99.9	5 13.6 -18.6	100.0	5 03.1 -19.5	100.1	4 52.6 -20.6	100.2	4 41.9 -21.5	100.3	4 31.1 -22.4	100.4	4 20.3 -23.4	100.4	4 17.1 -24.4	100.3	4 14.0 -23.4	100.2	4 11.9 -24.4	100.1	4 8.8 -25.4	100.0	8				
9	5 17.7 -16.7	100.8	5 06.4 -17.7	100.9	4 55.0 -18.7	101.0	4 43.6 -19.7	101.1	4 32.0 -20.6	101.1	4 20.4 -21.6	101.2	4 08.7 -22.6	101.3	3 56.9 -23.5	101.4	3 33.4 -23.6	102.3	3 30.8 -23.6	102.2	3 27.9 -23.6	102.1	3 24.8 -22.7	102.0	3 21.7 -23.7	102.0	10		
10	5 01.0 -16.8	101.8	4 48.7 -17.8	101.9	4 36.3 -18.7	101.9	4 23.9 -19.7	102.0	4 11.4 -20.7	102.1	3 58.8 -21.7	102.2	3 46.1 -22.6	102.2	3 33.4 -23.6	102.3	3 30.8 -23.6	102.2	3 27.9 -23.6	102.1	3 24.8 -22.7	102.0	3 21.7 -23.7	102.0	11				
11	4 44.2 -16.9	102.7	4 30.9 -17.8	102.8	4 17.6 -18.8	102.9	4 04.2 -19.8	103.0	3 50.7 -20.8	103.0	3 37.1 -21.7	103.1	3 23.5 -22.7	103.1	3 09.8 -23.6	103.2	3 06.7 -23.6	103.1	3 03.6 -24.6	103.0	2 46.2 -23.6	104.1	2 22.6 -23.7	105.0	2				
12	4 27.3 -16.9	103.7	4 13.1 -18.0	103.8	3 58.8 -18.9	103.8	3 44.4 -19.9	103.9	3 29.9 -20.8	104.0	3 00.8 -22.7	104.1	2 46.2 -23.6	104.1	2 22.6 -23.7	105.0	2 19.5 -24.6	105.9	2 15.4 -22.8	105.9	2 12.3 -23.8	105.9	2 09.2 -24.7	105.9	14				
13	4 10.4 -17.1	104.7	3 55.1 -17.9	104.7	3 39.9 -19.0	104.8	3 24.5 -19.9	104.9	3 09.1 -20.9	104.9	2 53.6 -21.8	105.0	2 38.1 -22.7	105.0	2 15.4 -22.8	105.9	1 58.9 -23.7	106.0	1 35.2 -23.7	106.9	1 32.1 -24.7	106.8	1 29.0 -23.7	106.7	15				
14	3 53.3 -17.1	105.6	3 37.2 -18.1	105.7	3 20.9 -19.0	105.7	3 04.6 -20.0	105.8	2 48.2 -20.9	105.8	2 13.8 -21.8	105.9	2 04.3 -22.0	105.9	0 42.3 -22.0	110.5	0 21.2 -22.8	110.6	0 00.2 -23.8	110.6	0 00.2 -23.8	110.6	0 00.2 -23.8	110.6	19				
15	3 36.2 -17.1	106.6	3 19.1 -18.1	106.6	3 01.9 -19.1	106.7	2 44.6 -20.0	106.7	2 27.3 -20.9	106.8	2 10.0 -21.9	106.8	1 52.6 -22.8	106.9	1 35.2 -23.7	106.9	1 32.1 -24.7	106.8	1 29.0 -23.8	106.7	1 25.9 -23.8	106.6	1 22.8 -23.7	106.5	1 19.7 -23.7	106.4	15		
16	3 19.1 -17.2	107.5	3 01.0 -18.2	107.6	2 42.8 -19.1	107.6	2 24.6 -20.0	107.7	2 06.4 -21.0	107.7	1 48.1 -21.9	107.8	1 29.8 -22.8	107.8	1 11.5 -23.8	107.8	1 08.4 -23.8	107.8	1 05.3 -23.8	107.8	1 02.2 -23.8	107.8	1 00.1 -23.8	107.8	16				
17	3 01.9 -17.3	108.5	2 42.8 -18.2	108.5	2 23.7 -19.1	108.6	2 04.6 -20.1	108.6	1 45.4 -21.0	108.7	1 26.2 -21.9	108.7	1 07.0 -22.9	108.7	0 47.7 -23.8	108.7	0 44.1 -23.8	109.6	0 23.9 -23.7	109.6	0 20.8 -23.7	109.6	0 17.7 -23.7	109.6	18				
18	2 44.6 -17.3	109.5	2 24.6 -18.2	109.5	2 04.6 -19.2	109.5	1 44.5 -21.0	109.6	1 24.4 -21.0	109.6	1 04.3 -22.0	109.6	0 42.3 -22.0	110.5	0 21.2 -22.8	110.6	0 00.2 -23.8	110.6	0 00.2 -23.8	110.6	0 00.2 -23.8	110.6	0 00.2 -23.8	110.6	19				
19	2 27.3 -17.3	110.4	2 06.4 -18.2	110.5	1 45.4 -19.2	110.5	1 24.4 -20.1	110.5	1 03.4 -21.1	110.5	0 20.3 -21.9	111.5	0 01.6 +22.9	68.5	0 23.6 +23.8	68.5	0 47.4 +23.7	67.6	0 24.5 +22.9	67.6	0 21.4 +23.7	67.6	0 18.3 +23.8	67.6	0 15.2 +23.8	67.6	20		
20	2 10.0 -17.4	111.4	1 48.1 -18.3	111.4	1 26.2 -19.2	111.4	1 04.3 -20.2	111.5	0 42.3 -21.1	111.5	0 21.2 -22.0	112.4	0 01.6 +22.0	67.6	0 24.5 +22.9	67.6	0 47.4 +23.7	66.7	0 23.6 +22.9	66.7	0 20.5 +23.7	66.7	0 17.4 +23.7	66.7	0 14.3 +23.7	66.7	22		
21	1 52.6 -17.4	112.3	1 29.8 -18.3	112.4	1 07.0 -19.3	112.4	0 44.1 -20.2	112.4	0 23.6 +22.0	112.4	0 0.2 -21.1	113.3	0 20.9 +21.1	65.7	0 47.4 +22.8	66.7	1 11.1 +23.8	66.7	1 34.9 +23.7	65.8	1 31.8 +23.7	65.8	1 28.7 +23.7	65.8	1 25.6 +23.7	65.8	23		
22	1 35.2 -17.4	113.3	1 11.5 -18.4	113.3	0 47.7 -19.3	113.3	0 23.9 -20.1	113.3	0 0.2 -21.1	113.3	0 20.9 +21.1	65.7	0 45.6 +21.9	65.7	1 10.2 +22.9	65.7	1 34.9 +23.7	65.8	1 31.8 +23.7	65.8	1 28.7 +23.7	65.8	1 25.6 +23.7	65.8	24				
23	1 17.8 -17.5	114.2	0 53.1 -18.4	114.3	0 28.4 -19.2	114.3	0 0.9 -20.2	114.3	0 16.4 -21.2	115.2	0 16.4 +20.2	64.8	0 42.0 +21.0	64.8	1 07.5 +22.0	64.8	1 33.1 +22.8	64.8	1 30.0 +22.8	64.8	1 27.9 +22.8	64.8	1 24.8 +22.8	64.8	24				
24	1 00.3 -17.5	115.2	0 34.7 -18.3	115.2	0 16.4 -19.2	115.2	0 0.9 -20.2	115.2	0 16.4 +20.2	116.1	0 26.0 +21.0	61.0	0 35.1 +21.8	61.0	2 35.1 +21.8	61.0	3 33.0 +23.5	61.2	3 30.9 +23.5	61.2	3 27.8 +23.5	61.2	3 24.7 +23.5	61.2	28				
25	0 42.8 -17.5	116.2	0 16.4 -18.4	116.2	0 10.1 +19.3	63.8	0 36.6 +20.1	63.8	1 03.0 +21.0	63.8	1 29.5 +21.9	63.9	1 55.9 +22.7	63.9	2 22.2 -23.7	63.9	3 20.0 +23.7	63.9	3 17.8 +23.7	63.9	3 15.6 +23.7	63.9	3 13.4 +23.7	63.9	34				
26	0 25.3 -17.5	117.1	0 20.4 +18.4	61.9	0 29.4 +19.2	61.9	0 56.7 +19.3	61.9	1 16.9 +20.1	62.0	1 45.1 +20.9	62.0	2 13.2 +21.9	62.0	2 13.2 +21.9	62.0	2 10.0 +22.7	62.0	2 08.0 +22.7	62.0	2 05.9 +22.7	62.0	2 03.8 +22.7	62.0	26				
27	0 07.8 -17.5	118.1	0 20.4 +18.4	61.9	0 20.4 +18.4	61.9	0 20.4 +18.4	61.9	0 20.4 +18.4	61.9	0 20.4 +18.4	61.9	0 20.4 +18.4	61.9	0 20.4 +18.4	61.9	0 18.3 +18.4	61.9	0 16.2 +18.4	61.9	0 14.1 +18.4	61.9	0 11.9 +18.4	61.9	28				
28	0 09.7 +17.5	61.0	0 38.8 +18.3	61.0	1 07.9 +19.2	61.0	1 37.0 +20.1	61.0	1 27.0 +20.9	60.1	2 56.9 +21.7	60.1	3 26.7 +22.6	60.2	3 26.7 +22.6	60.2	3 24.6 +22.6	60.2	3 22.5 +22.6	60.2	3 20.4 +22.6	60.2	3 18.3 +22.6	60.2	29				
29	0 27.2 +17.5	60.0	0 57.1 +18.4	60.0	1 27.1 +19.2	60.0																							

83°, 277° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180°Zn=7
L.H.A. less than 180°Zn=360°-Z

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.				
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z					
0	6 45.6 +15.6	91.8	6 43.7 +16.5	91.9	6 41.6 +17.6	92.1	6 39.3 +18.7	92.2	6 37.0 +19.6	92.3	6 34.6 +20.6	92.4	6 32.0 +21.6	92.5	6 29.3 +22.5	92.6	6 27.0 +23.5	92.7	6 24.3 +24.5	92.8	6 21.0 +25.5	92.9	6 17.7 +26.5	93.0	0				
1	7 01.2 +15.5	90.8	7 00.2 +16.5	91.0	6 59.2 +17.5	91.1	6 58.0 +18.5	91.2	6 56.6 +19.5	91.3	6 55.2 +20.4	91.5	6 53.6 +21.4	91.6	6 51.8 +22.5	91.7	6 49.0 +23.5	91.8	6 46.2 +24.5	91.9	6 43.4 +25.5	92.0	6 40.6 +26.5	92.1	6 37.8 +27.5	92.2	1		
2	7 16.7 +15.3	89.9	7 16.7 +16.4	90.0	7 16.7 +17.3	90.1	7 16.5 +18.3	90.3	7 16.1 +19.4	90.4	7 15.6 +20.4	90.5	7 15.0 +21.4	90.6	7 14.3 +22.4	90.8	7 13.6 +23.4	91.0	7 12.9 +24.4	91.1	7 12.2 +25.4	91.2	7 11.5 +26.4	91.3	7 10.8 +27.4	91.4	2		
3	7 32.0 +15.2	88.9	7 33.1 +16.2	89.0	7 34.0 +17.3	89.2	7 34.8 +18.3	89.3	7 35.5 +19.2	89.4	7 36.0 +20.3	89.6	7 36.4 +21.3	89.7	7 36.7 +22.2	89.8	7 37.0 +23.2	89.9	7 37.3 +24.2	90.0	7 37.6 +25.2	90.1	7 37.9 +26.2	90.2	7 38.2 +27.2	90.3	3		
4	7 47.2 +15.1	87.9	7 49.3 +16.1	88.1	7 51.3 +17.1	88.2	7 53.1 +18.1	88.3	7 54.7 +19.2	88.5	7 56.3 +20.1	88.6	7 57.7 +21.1	88.8	7 58.9 +22.1	88.9	7 59.1 +23.1	89.0	7 59.3 +24.1	89.1	7 59.5 +25.1	89.2	7 59.7 +26.1	89.3	7 59.9 +27.1	89.4	4		
5	8 02.3 +14.5	86.9	8 05.4 +15.4	87.1	8 08.4 +16.9	87.2	8 11.2 +18.0	87.4	8 13.9 +19.0	87.5	8 16.4 +20.0	87.7	8 18.8 +20.9	87.8	8 21.0 +21.9	88.0	8 23.2 +22.9	88.1	8 25.4 +23.9	88.2	8 27.6 +24.9	88.3	8 29.8 +25.9	88.4	8 32.0 +26.9	88.5	5		
6	8 17.2 +14.8	86.0	8 21.3 +15.9	86.1	8 25.3 +16.9	86.3	8 29.2 +17.8	86.4	8 32.9 +18.8	86.6	8 36.4 +19.8	86.7	8 39.7 +20.8	86.9	8 42.9 +21.8	87.0	8 46.1 +22.8	87.1	8 49.3 +23.8	87.2	8 52.5 +24.8	87.3	8 55.7 +25.8	87.4	8 58.9 +26.8	87.5	6		
7	8 32.0 +14.6	85.0	8 37.2 +15.6	85.1	8 42.2 +16.6	85.3	8 47.0 +17.7	85.4	8 51.7 +18.7	85.6	8 56.2 +19.7	85.8	9 00.6 +20.7	85.9	9 04.8 +21.7	86.1	9 08.0 +22.7	86.3	9 11.2 +23.7	86.5	9 14.4 +24.7	86.7	9 17.6 +25.7	86.9	9 20.8 +26.7	87.1	7		
8	8 46.6 +14.5	84.0	8 52.8 +15.5	84.2	8 58.8 +16.6	84.3	9 04.7 +17.5	84.5	9 10.4 +18.5	84.6	9 15.9 +19.6	84.8	9 21.3 +20.5	85.0	9 26.5 +21.5	85.1	9 30.7 +22.5	85.3	9 34.5 +23.5	85.5	9 38.3 +24.5	85.7	9 42.1 +25.5	85.9	9 45.9 +26.5	86.1	8		
9	9 01.1 +14.4	83.0	9 08.3 +15.4	83.2	9 15.4 +16.3	83.3	9 22.2 +17.4	83.5	9 28.9 +18.4	83.7	9 35.5 +19.3	83.8	9 41.8 +20.4	84.0	9 48.0 +21.4	84.2	9 51.6 +22.4	84.4	9 55.3 +23.4	84.6	9 58.9 +24.4	84.8	9 62.5 +25.4	85.0	9 65.9 +26.4	85.2	9		
10	9 15.5 +14.1	82.0	9 23.7 +15.2	82.2	9 31.7 +16.2	82.4	9 39.6 +17.2	82.5	9 47.3 +18.2	82.7	9 54.8 +19.3	82.9	10 02.2 +20.2	83.1	10 09.4 +21.2	83.2	10 16.6 +22.2	83.3	10 23.8 +23.2	83.4	10 31.0 +24.2	83.5	10 38.2 +25.2	83.6	10 45.4 +26.2	83.7	10		
11	9 29.6 +14.0	81.1	9 38.9 +15.0	81.2	9 47.9 +16.1	81.4	9 56.8 +17.1	81.6	10 05.5 +18.1	81.7	10 14.1 +19.0	81.9	10 22.4 +20.1	82.1	10 30.6 +21.0	82.3	10 38.8 +22.0	82.5	10 47.0 +23.0	82.7	10 55.6 +24.0	82.9	10 63.4 +25.0	83.1	10 71.2 +26.0	83.3	11		
12	9 43.6 +13.9	80.1	9 53.9 +14.8	80.2	10 04.0 +15.8	80.4	10 13.9 +16.8	80.6	10 23.6 +17.9	80.8	10 33.1 +18.9	81.0	10 42.5 +19.8	81.1	10 51.6 +20.9	81.3	10 60.4 +22.9	81.5	10 69.2 +23.9	81.7	10 78.0 +24.9	81.9	10 86.8 +25.9	82.1	10 95.6 +26.9	82.3	12		
13	9 57.5 +13.6	79.1	10 08.7 +14.7	79.3	10 19.8 +15.7	79.4	10 30.7 +16.7	79.6	10 41.5 +17.7	79.8	10 52.0 +18.7	80.0	11 02.3 +19.7	80.2	11 12.5 +20.6	80.4	11 22.0 +21.5	80.6	11 32.1 +22.5	80.8	11 42.0 +23.5	81.0	11 51.8 +24.5	81.2	11 61.6 +25.5	81.4	13		
14	10 11.1 +13.5	78.1	10 23.4 +14.5	78.3	10 35.5 +15.5	78.5	10 47.4 +16.5	78.6	10 59.2 +17.5	78.8	11 07.7 +18.5	79.0	11 22.0 +19.5	79.2	11 33.1 +20.5	79.4	11 43.9 +21.5	79.6	11 54.7 +22.5	79.8	11 65.5 +23.5	80.0	11 76.3 +24.5	80.2	11 87.1 +25.5	80.4	14		
15	10 24.6 +13.3	77.1	10 37.9 +14.3	77.3	10 51.0 +15.3	77.5	11 03.9 +16.4	77.7	11 16.7 +17.3	77.9	11 29.2 +18.3	78.0	11 41.5 +19.3	78.2	11 53.6 +20.3	78.5	11 65.3 +21.3	78.7	11 77.0 +22.3	78.9	11 88.7 +23.3	79.1	11 99.4 +24.3	79.3	11 109.1 +25.3	79.5	15		
16	10 37.9 +13.1	76.1	10 52.2 +14.1	76.3	11 06.3 +15.2	76.5	11 20.3 +16.1	76.7	11 34.0 +17.1	76.9	11 47.5 +18.1	77.1	12 00.8 +19.1	77.3	12 13.9 +20.1	77.5	12 27.4 +21.1	77.7	12 41.3 +22.1	77.9	12 55.2 +23.1	78.1	12 69.1 +24.1	78.3	12 83.0 +25.1	78.5	16		
17	10 51.0 +12.9	75.1	11 06.3 +14.0	75.3	11 21.5 +14.9	75.5	11 36.4 +15.9	75.7	11 51.1 +16.9	75.9	12 05.6 +17.9	76.1	12 19.9 +18.9	76.3	12 34.0 +19.9	76.5	12 47.1 +20.9	76.7	12 59.3 +21.9	76.9	12 71.1 +22.9	77.1	12 83.9 +23.9	77.3	12 95.7 +24.9	77.5	17		
18	11 03.9 +12.8	74.1	11 20.3 +13.7	74.3	11 36.4 +14.7	74.5	11 52.3 +15.7	74.7	12 08.0 +16.7	74.9	12 23.5 +17.7	75.1	12 41.2 +17.5	75.4	12 57.5 +18.5	75.7	13 13.6 +19.5	75.9	13 31.3 +20.5	76.1	13 49.3 +21.5	76.3	13 67.3 +22.5	76.5	13 85.3 +23.5	76.7	18		
19	11 16.7 +12.5	73.1	11 34.0 +13.5	73.3	11 51.1 +14.5	73.5	12 08.0 +15.5	73.7	12 24.7 +16.5	73.9	12 41.2 +17.5	74.1	12 57.5 +18.5	74.4	13 13.6 +19.5	74.6	13 31.3 +20.5	74.8	13 49.3 +21.5	75.0	13 67.3 +22.5	75.2	13 85.3 +23.5	75.4	13 94.1 +24.5	75.6	19		
20	11 29.2 +12.3	72.1	11 47.5 +13.3	72.3	12 05.6 +14.3	72.5	12 23.5 +15.3	72.7	12 41.2 +16.3	72.9	12 58.7 +17.3	73.2	13 16.0 +18.2	73.4	13 33.0 +19.3	73.6	13 50.0 +20.3	73.8	13 67.0 +21.3	74.0	13 83.8 +22.3	74.2	13 99.6 +23.3	74.4	13 113.4 +24.3	74.6	20		
21	11 41.5 +12.1	71.1	12 00.8 +13.1	71.3	12 19.9 +14.1	71.5	12 38.8 +15.1	71.7	12 57.5 +16.1	72.0	13 16.0 +17.0	72.2	13 34.2 +18.1	72.4	13 52.3 +19.0	72.6	13 69.1 +20.0	72.8	13 86.9 +21.0	73.0	13 99.8 +22.0	73.2	13 116.7 +23.0	73.4	13 134.5 +24.0	73.6	21		
22	11 53.6 +11.9	70.1	12 13.9 +12.9	70.3	12 34.0 +13.9	70.5	12 53.9 +14.9	70.7	13 13.6 +15.8	71.0	13 33.0 +16.8	71.2	13 52.3 +17.7	71.4	14 11.3 +18.7	71.7	14 31.3 +19.7	71.9	14 49.3 +20.7	72.1	14 67.3 +21.7	72.3	14 85.3 +22.7	72.5	14 103.3 +23.7	72.7	22		
23	12 05.5 +11.7	69.1	12 26.8 +12.7	69.3	12 47.9 +13.6	69.5	13 08.8 +14.6	69.8	13 29.4 +15.6	70.0	13 49.8 +16.6	70.2	14 10.0 +17.6	70.4	14 30.0 +18.6	70.7	14 49.8 +19.6	71.0	14 68.8 +20.6	71.2	14 87.8 +21.6	71.4	14 106.8 +22.6	71.6	14 125.6 +23.6	71.8	23		
24	12 17.2 +11.5	68.1	12 39.5 +12.5	68.3	13 01.5 +13.5	68.5	13 45.9 +14.5	68.7	14 19.5 +15.4	69.0	14 45.0 +16.4	69.2	15 10.2 +15.5	69.5	15 35.2 +16.5	69.7	15 55.2 +17.5	69.9	15 75.2 +18.5	70.1	15 95.2 +19.5	70.3	15 115.2 +20.5	70.5	15 135.2 +21.5	70.7	24		
25	12 28.7 +11.2	67.1	12 51.9 +12.2	67.3	13 15.0 +13.1	67.5	13 37.8 +14.1	67.8	14 00.4 +15.1	68.0	14 22.7 +16.1	68.2	14 44.9 +17.0	68.5	15 06.8 +18.0	68.7	15 27.4 +19.0	69.1	15 48.1 +20.0	69.4	15 68.8 +21.0	69.7	15 88.5 +22.0	70.0	15 108.2 +23.0	70.3	15 128.9 +24.0	70.6	25
26	12 39.9 +11.1	66.1	13 04.1 +12.0	66.3	14 30.4 +11.6	66.5	15 58.9 +12.6	66.7	15 27.2 +13.5	67.0	15 55.3 +14.4	67.2	16 01.9 +15.4	67.5	16 23.1 +16.4	67.8	16 43.3 +17.4	68.0	16 63.2 +18.4	68.3	16 83.1 +19.4	68.6	16 103.0 +20.4	68.9	16 123.8 +21.4	69.2	16 143.6 +22.4	69.5	26
27	12 47.8 +10.9	65.1	13 16.1 +11.8	65.3	13 41.1 +12.7	65.5	14 05.8 +13.7	65.8	14 30.3 +14.6	66.0	15 11.5 +12.3	66.5	15 40.7 +13.3	67.0	16 09.7 +14														

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 83°, 277°

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.		
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z			
0	6 45.6 -15.7	91.8	6 43.7 -16.8	91.9	6 41.6 -17.8	92.1	6 39.3 -18.7	92.2	6 37.0 -19.7	92.3	6 34.6 -20.8	92.4	6 32.0 -21.7	92.5	6 29.3 -22.7	92.6	6 27.0 -23.7	92.7	6 24.6 -24.7	92.8	6 22.2 -25.7	92.9	6 19.8 -26.7	93.0	0		
1	6 29.9 -15.8	92.8	6 26.9 -16.8	92.9	6 23.8 -17.8	93.0	6 20.6 -18.8	93.1	6 17.3 -19.8	93.2	6 13.8 -20.8	93.3	6 10.3 -21.8	93.5	6 06.6 -22.8	93.6	6 03.1 -23.8	93.7	5 58.5 -24.8	93.8	5 45.2 -25.8	93.9	5 31.9 -26.8	94.0	5 18.6 -27.8	94.1	1
2	6 14.1 -15.9	93.8	6 10.1 -16.9	93.9	6 06.0 -17.9	94.0	6 01.8 -18.9	94.1	5 57.5 -19.9	94.2	5 53.0 -20.9	94.3	5 48.5 -21.9	94.4	5 43.8 -22.8	94.5	5 39.1 -23.8	94.6	5 34.8 -24.8	94.7	5 29.9 -25.8	94.8	5 25.1 -26.8	94.9	5 21.0 -27.8	95.0	3
3	5 58.2 -16.0	94.7	5 53.2 -17.0	94.8	5 48.1 -18.0	94.9	5 42.9 -19.0	95.0	5 37.6 -20.1	95.1	5 32.1 -21.0	95.2	5 26.6 -22.0	95.3	5 21.0 -23.0	95.4	5 16.4 -24.0	95.5	5 11.1 -25.0	95.6	5 5.4 -26.0	95.7	5 0.1 -27.0	95.8	4 58.0 -23.0	95.9	4
4	5 42.2 -16.1	95.7	5 36.2 -17.1	95.8	5 30.1 -18.1	95.9	5 23.9 -19.2	96.0	5 17.5 -20.1	96.1	5 11.1 -21.0	96.2	5 0.46 -22.0	96.3	4 58.0 -23.0	96.4	4 58.0 -23.0	96.5	4 58.0 -23.0	96.6	4 58.0 -23.0	96.7	4 58.0 -23.0	96.8	4		
5	5 26.1 -16.2	96.7	5 19.1 -17.2	96.8	5 12.0 -18.2	96.9	5 0.47 -19.1	96.9	4 57.4 -20.1	97.0	4 50.1 -21.2	97.1	4 42.6 -22.1	97.2	4 35.0 -23.1	97.3	4 28.2 -24.1	97.4	4 20.5 -25.1	97.5	4 12.8 -26.1	97.6	4 5.1 -27.1	97.7	5		
6	5 09.9 -16.3	97.6	5 01.9 -17.3	97.7	4 53.8 -18.3	97.8	4 45.6 -19.3	97.9	4 37.3 -20.3	98.0	4 28.9 -21.2	98.1	4 20.5 -22.2	98.2	4 11.9 -23.1	98.3	4 0.5 -24.1	98.4	3 58.3 -23.1	98.5	3 48.8 -23.2	98.6	3 36.0 -23.3	98.7	3 25.6 -23.3	98.8	7
7	4 53.6 -16.4	98.6	4 44.6 -17.4	98.7	4 35.5 -18.4	98.8	4 26.3 -19.4	98.8	4 17.0 -20.3	98.9	4 0.77 -21.3	99.0	3 56.7 -20.4	99.1	3 46.4 -21.4	99.2	3 36.0 -22.3	99.3	3 25.6 -23.3	99.4	3 21.5 -24.3	99.5	3 0.54 -25.3	99.6	8		
8	4 37.2 -16.4	99.6	4 27.2 -17.4	99.6	4 17.1 -18.4	99.7	4 0.69 -19.4	99.8	3 56.7 -20.4	99.9	3 46.4 -21.4	99.9	3 36.0 -22.3	100.0	3 25.6 -23.3	100.1	3 21.5 -24.3	100.2	3 0.54 -25.3	100.3	3 0.23 -23.3	100.4	9				
9	4 20.8 -16.6	100.5	4 09.8 -17.6	100.6	3 58.7 -18.5	100.7	3 47.5 -19.4	100.7	3 36.3 -20.4	100.8	3 25.0 -21.4	100.9	3 13.7 -22.4	100.9	3 0.23 -23.3	101.0	3 0.23 -23.3	101.1	3 0.23 -23.3	101.2	3 0.23 -23.3	101.3	10				
10	4 04.2 -16.6	101.6	3 52.2 -17.5	101.6	3 40.2 -18.6	101.6	3 28.1 -19.6	101.7	3 15.9 -20.5	101.7	3 0.36 -21.4	101.8	2 51.3 -22.4	101.9	2 39.0 -23.4	101.9	2 39.0 -23.4	101.9	2 39.0 -23.4	101.9	2 39.0 -23.4	101.9	10				
11	3 47.6 -16.6	102.5	3 34.7 -17.7	102.5	3 21.6 -18.6	102.6	3 0.85 -19.6	102.6	2 55.4 -20.6	102.7	2 42.2 -21.5	102.8	2 28.9 -22.4	102.8	2 15.6 -23.4	102.8	2 15.6 -23.4	102.8	2 15.6 -23.4	102.8	2 15.6 -23.4	102.8	11				
12	3 31.0 -16.7	103.4	3 17.0 -17.7	103.5	3 0.30 -18.7	103.5	2 48.9 -19.6	103.6	2 34.8 -20.6	103.6	2 20.7 -21.6	103.7	2 0.65 -22.5	103.7	1 52.2 -23.4	103.7	1 52.2 -23.4	103.7	1 52.2 -23.4	103.7	1 52.2 -23.4	103.7	12				
13	3 14.3 -16.8	104.4	2 59.3 -17.7	104.4	2 44.3 -18.7	104.5	2 29.3 -19.7	104.5	2 14.2 -20.6	104.6	1 59.1 -21.5	104.6	1 44.0 -22.5	104.6	1 28.8 -23.4	104.7	1 28.8 -23.4	104.7	1 28.8 -23.4	104.7	1 28.8 -23.4	104.7	13				
14	2 57.5 -16.8	105.3	2 41.6 -17.8	105.4	2 25.6 -18.7	105.4	2 0.96 -19.7	105.5	1 53.6 -20.6	105.5	1 37.6 -21.6	105.5	1 21.5 -22.6	105.6	1 0.54 -23.5	105.6	1 0.54 -23.5	105.6	1 0.54 -23.5	105.6	1 0.54 -23.5	105.6	14				
15	2 40.7 -16.9	106.3	2 23.8 -17.8	106.3	2 0.69 -18.8	106.4	1 49.9 -19.7	106.4	1 33.0 -20.7	106.4	1 16.0 -21.6	106.5	0 58.9 -22.5	106.5	0 41.9 -23.5	106.5	0 41.9 -23.5	106.5	0 41.9 -23.5	106.5	0 41.9 -23.5	106.5	15				
16	2 23.8 -16.9	107.3	2 06.0 -17.9	107.3	1 48.1 -18.8	107.3	1 30.2 -19.7	107.4	1 12.3 -20.7	107.4	0 54.4 -21.7	107.4	0 36.4 -22.6	107.4	0 18.4 -23.4	107.4	0 18.4 -23.4	107.4	0 18.4 -23.4	107.4	0 18.4 -23.4	107.4	16				
17	2 06.9 -17.0	108.2	1 48.1 -17.9	108.3	1 29.3 -18.8	108.3	1 10.5 -19.8	108.3	0 51.6 -20.7	108.3	0 11.1 -21.7	109.3	0 0.87 +22.6	109.3	0 28.5 +23.5	109.3	0 28.5 +23.5	109.3	0 28.5 +23.5	109.3	0 28.5 +23.5	109.3	17				
18	1 49.9 -16.9	109.2	1 30.2 -17.9	109.2	1 10.5 -18.9	109.2	0 50.7 -19.8	109.3	0 30.9 -20.7	109.3	0 10.2 -20.8	110.2	0 10.6 +21.6	109.8	0 52.0 +23.4	109.8	0 52.0 +23.4	109.8	0 52.0 +23.4	109.8	0 52.0 +23.4	109.8	18				
19	1 33.0 -17.0	110.1	1 12.3 -17.9	110.2	0 51.6 -18.9	110.2	0 30.9 -19.8	110.2	0 10.2 -20.8	110.2	0 10.6 +21.6	109.8	0 31.3 +22.5	109.8	0 52.0 +23.4	109.8	0 52.0 +23.4	109.8	0 52.0 +23.4	109.8	0 52.0 +23.4	109.8	19				
20	1 16.0 -17.1	111.1	0 54.4 -18.0	111.1	0 32.7 -18.9	111.1	0 11.1 -19.8	111.1	0 10.6 +20.7	111.1	0 32.2 +21.6	111.1	0 53.8 +22.6	111.1	1 15.4 +23.5	111.1	1 15.4 +23.5	111.1	1 15.4 +23.5	111.1	1 15.4 +23.5	111.1	20				
21	0 58.9 -17.0	112.1	0 36.4 -18.0	112.1	0 13.8 -18.8	112.1	0 0.87 +19.8	112.1	0 0.87 +19.8	112.1	0 31.3 +20.7	112.1	0 53.8 +22.6	112.1	1 16.4 +22.5	112.1	1 16.4 +22.5	112.1	1 16.4 +22.5	112.1	1 16.4 +22.5	112.1	21				
22	0 41.9 -17.0	113.0	0 18.4 -17.9	113.0	0 0.50 +18.9	113.0	0 23.9 +18.9	113.0	0 23.9 +18.9	113.0	0 28.5 +19.8	113.0	0 52.0 +20.7	113.0	1 15.4 +21.4	113.0	1 15.4 +21.4	113.0	1 15.4 +21.4	113.0	1 15.4 +21.4	113.0	22				
23	0 24.9 -17.1	114.0	0 0.05 -18.0	114.0	0 17.5 +18.0	115.1	0 42.8 +18.9	115.1	0 1.81 +19.7	115.1	0 10.6 +21.6	115.1	0 31.6 +22.5	115.1	2 23.8 +22.4	115.1	2 23.8 +22.4	115.1	2 23.8 +22.4	115.1	2 23.8 +22.4	115.1	23				
24	0 07.8 -17.1	114.9	0 17.5 +18.0	115.1	0 0.00 +18.0	115.1	0 1.81 +19.7	115.1	0 1.81 +19.7	115.1	0 10.6 +20.7	115.1	0 31.6 +22.5	115.1	2 23.8 +22.4	115.1	2 23.8 +22.4	115.1	2 23.8 +22.4	115.1	2 23.8 +22.4	115.1	24				
25	0 09.3 +17.0	64.1	0 35.5 +17.9	64.1	1 01.7 +18.8	64.1	1 27.8 +19.8	64.1	1 54.0 +20.6	64.2	2 20.1 +21.5	64.2	2 46.2 +22.4	64.2	3 12.3 +23.2	64.3	3 12.3 +23.2	64.3	3 12.3 +23.2	64.3	3 12.3 +23.2	64.3	25				
26	0 26.3 +17.1	63.1	0 53.4 +18.0	63.2	1 20.5 +18.8	63.2	1 47.6 +19.7	63.2	2 14.6 +20.6	63.2	2 41.6 +21.5	63.3	3 08.6 +22.3	63.3	3 35.5 +23.2	63.4	3 35.5 +23.2	63.4	3 35.5 +23.2	63.4	3 35.5 +23.2	63.4	26				
27	0 43.4 +17.0	62.2	1 11.4 +17.9	62.2	1 39.3 +18.8	62.2	2 07.3 +19.7	62.2	2 35.2 +20.6	62.3	3 03.1 +21.4	62.3	3 30.9 +22.3	62.4	3 58.7 +23.2	62.4	3 58.7 +23.2	62.4	3 58.7 +23.2	62.4	3 58.7 +23.2	62.4	27				
28	1 00.4 +17.0	61.2	1 29.3 +17.9	61.2	1 58.1 +18.8	61.3	2 27.0 +19.6	61.3	2 55.8 +20.5	61.3	3 24.5 +21.4	61.4	4 21.9 +23.0	61.5	4 44.9 +23.0	61.6	4 44.9 +23.0	61.6	4 44.9 +23.0	61.6	4 44.9 +23.0	61.6	28				
29	1 17.4 +17.0	60.3	1 47.2 +17.8	60.3	2 16.9 +18.7	60.3	2 46.6 +19.6	60.4	3 16.3 +20.4	60.4	3 45.9 +21.3	60.5	4 15.4 +22.2	60.5	4 44.9 +23.0	60.6	4 44.9 +23.0	60.6	4 44.9 +23.0	60.6	4 44.9 +23.0	60.6	29				
30	1 34.4 +17.0	59.3	2 05.0 +17.9	59.3	2 35.6 +18.7	59.4	3 06.2 +19.5	59.4	3 36.7 +20.4	59.5	4 07.2 +21.2	59.5	4 37.6 +22.0	59.6	5 07.9 +22.9	59.7	5 07.9 +22.9	59.7	5 07.9 +22.9	59.7	5 07.9 +22.9	59.7	30				
31	1 51.4 +16.9	58.3	2 22.9 +17.8	58.4	2 54.3 +18.7	58.4	3 25.7 +19.5	58.5	3 57.1 +20.3	58.5	4 28.4 +21.1	58.6	4 59.6 +22.0	58.7	5 30.8 +22.8	58.7											

84°, 276° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180°Zn=7
L.H.A. less than 180°Zn=360°-Z

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	
0	5 47.7 +15.5	91.6	5 46.0 +16.6	91.7	5 44.2 +17.6	91.8	5 42.3 +18.6	91.9	5 40.3 +19.6	92.0	5 38.2 +20.6	92.1	5 36.0 +21.6	92.2	5 33.7 +22.5	92.3	0	5 33.7 +22.5	92.3	5 33.7 +22.5	92.3	5 33.7 +22.5	92.3	0	
1	6 03.2 +15.5	90.6	6 02.6 +16.4	90.7	6 01.8 +17.5	90.8	6 00.9 +18.5	90.9	5 59.9 +19.5	91.0	5 58.8 +20.5	91.1	5 57.6 +21.4	91.2	5 56.2 +22.5	91.3	1	5 56.2 +22.5	91.3	5 56.2 +22.5	91.3	5 56.2 +22.5	91.3	1	
2	6 18.7 +15.4	89.6	6 19.0 +16.4	89.7	6 19.3 +17.4	89.8	6 19.4 +18.4	89.9	6 19.4 +19.4	90.1	6 19.3 +20.3	90.2	6 19.0 +21.4	90.3	6 18.7 +22.3	90.4	2	6 18.7 +22.3	90.4	6 18.7 +22.3	90.4	6 18.7 +22.3	90.4	2	
3	6 34.1 +15.2	88.6	6 35.4 +16.3	88.8	6 36.7 +17.2	88.9	6 37.8 +18.2	89.0	6 38.8 +19.2	89.1	6 39.6 +20.3	89.2	6 40.4 +21.3	89.3	6 41.0 +22.3	89.5	3	6 41.0 +22.3	89.5	6 41.0 +22.3	89.5	6 41.0 +22.3	89.5	3	
4	6 49.3 +15.1	87.7	6 51.7 +16.1	87.8	6 53.9 +17.2	87.9	6 56.0 +18.2	88.0	6 58.0 +19.2	88.2	6 59.9 +20.2	88.3	7 01.7 +21.1	88.4	7 03.3 +22.1	88.5	4	7 03.3 +22.1	88.5	7 03.3 +22.1	88.5	7 03.3 +22.1	88.5	4	
5	7 04.4 +15.0	86.7	7 07.8 +16.0	86.8	7 11.1 +17.0	86.9	7 14.2 +18.0	87.1	7 17.2 +19.0	87.2	7 20.1 +20.0	87.3	7 22.8 +21.0	87.5	7 25.4 +22.0	87.6	5	7 25.4 +22.0	87.6	7 25.4 +22.0	87.6	7 25.4 +22.0	87.6	5	
6	7 19.4 +14.9	85.7	7 23.8 +15.9	85.8	7 28.1 +16.9	86.0	7 32.2 +17.9	86.1	7 36.2 +18.9	86.2	7 40.1 +19.9	86.4	7 43.8 +20.9	86.5	7 47.4 +21.9	86.6	6	7 47.4 +21.9	86.6	7 47.4 +21.9	86.6	7 47.4 +21.9	86.6	6	
7	7 34.3 +14.7	84.7	7 39.7 +15.8	84.9	7 45.0 +16.8	85.0	7 50.1 +17.8	85.1	7 55.1 +18.8	85.3	8 00.0 +19.8	85.4	8 04.7 +20.8	85.6	8 09.3 +21.7	85.7	7	8 09.3 +21.7	85.7	8 09.3 +21.7	85.7	8 09.3 +21.7	85.7	7	
8	7 49.0 +14.6	83.8	7 55.5 +15.6	83.9	8 01.8 +16.6	84.0	8 07.9 +17.7	84.2	8 13.9 +18.7	84.3	8 19.8 +19.6	84.5	8 25.5 +20.6	84.6	8 31.0 +21.7	84.8	8	8 31.0 +21.7	84.8	8 31.0 +21.7	84.8	8 31.0 +21.7	84.8	8	
9	8 03.6 +14.5	82.8	8 11.1 +15.4	82.9	8 18.4 +16.5	83.1	8 25.6 +17.4	83.2	8 32.6 +18.5	83.4	8 39.4 +19.5	83.5	8 46.1 +20.5	83.7	8 52.7 +21.4	83.8	9	8 52.7 +21.4	83.8	8 52.7 +21.4	83.8	8 52.7 +21.4	83.8	9	
10	8 18.1 +14.3	81.8	8 26.5 +15.4	81.9	8 34.9 +16.3	82.1	8 43.0 +17.4	82.2	8 51.1 +18.3	82.4	8 58.9 +19.4	82.6	9 06.6 +20.4	82.7	9 14.1 +21.4	82.9	10	9 14.1 +21.4	82.9	9 14.1 +21.4	82.9	9 14.1 +21.4	82.9	10	
11	8 32.4 +14.2	80.8	8 41.9 +15.2	81.0	8 51.2 +16.2	81.1	9 00.4 +17.2	81.3	9 09.4 +18.2	81.4	9 18.3 +19.2	81.6	9 27.0 +20.1	81.8	9 35.5 +21.1	81.9	11	9 35.5 +21.1	81.9	9 35.5 +21.1	81.9	9 35.5 +21.1	81.9	11	
12	8 46.6 +14.0	79.8	8 57.1 +15.0	80.0	9 07.4 +16.1	80.1	9 17.6 +17.0	80.3	9 27.6 +18.1	80.5	9 37.5 +19.0	80.6	9 47.1 +20.1	80.8	9 56.6 +21.0	81.0	12	9 56.6 +21.0	81.0	9 56.6 +21.0	81.0	9 56.6 +21.0	81.0	12	
13	9 00.6 +13.8	78.9	9 12.1 +14.9	79.0	9 23.5 +15.8	79.2	9 34.6 +16.9	79.3	9 45.7 +17.8	79.5	9 56.5 +18.9	79.7	10 07.2 +19.8	79.8	10 17.6 +20.9	80.0	13	10 17.6 +20.9	80.0	10 17.6 +20.9	80.0	10 17.6 +20.9	80.0	13	
14	9 14.4 +13.7	77.9	9 27.0 +14.7	78.0	9 39.3 +15.7	78.2	9 51.5 +16.7	78.4	10 03.5 +17.7	78.5	10 15.4 +18.7	78.7	10 27.0 +19.7	78.9	10 38.5 +20.7	79.1	14	10 38.5 +20.7	79.1	10 38.5 +20.7	79.1	10 38.5 +20.7	79.1	14	
15	9 28.1 +13.6	76.9	9 41.7 +14.5	77.0	9 55.0 +15.6	77.2	10 08.2 +16.6	77.4	10 21.2 +17.6	77.6	10 34.1 +18.5	77.7	10 46.7 +19.5	77.9	10 59.2 +20.5	78.1	15	10 59.2 +20.5	78.1	10 59.2 +20.5	78.1	10 59.2 +20.5	78.1	15	
16	9 41.7 +13.3	75.9	9 56.2 +14.4	76.1	10 10.6 +15.3	76.2	10 24.8 +16.3	76.4	10 38.3 +17.3	76.6	10 52.6 +18.3	76.8	11 06.2 +19.3	77.0	11 19.7 +20.3	77.2	16	11 19.7 +20.3	77.2	11 19.7 +20.3	77.2	11 19.7 +20.3	77.2	16	
17	9 55.0 +13.2	74.9	10 10.6 +14.2	75.1	10 25.9 +15.2	75.3	10 41.1 +16.2	75.4	10 56.1 +17.2	75.6	11 10.9 +18.2	75.8	11 25.5 +19.2	76.0	11 40.0 +20.1	76.2	17	11 40.0 +20.1	76.2	11 40.0 +20.1	76.2	11 40.0 +20.1	76.2	17	
18	10 08.2 +13.0	73.9	10 24.8 +14.0	74.1	10 41.1 +15.0	74.3	10 57.3 +16.0	74.5	11 13.3 +17.0	74.6	11 29.1 +17.9	74.8	11 44.7 +18.9	75.0	12 00.1 +19.9	75.2	18	12 00.1 +19.9	75.2	12 00.1 +19.9	75.2	12 00.1 +19.9	75.2	18	
19	10 21.2 +12.9	72.9	10 38.8 +13.8	73.1	10 56.1 +14.8	73.3	11 13.3 +15.8	73.5	11 30.3 +16.7	73.7	11 47.0 +17.8	73.9	12 03.6 +18.8	74.1	12 20.0 +19.7	74.3	19	12 20.0 +19.7	74.3	12 20.0 +19.7	74.3	12 20.0 +19.7	74.3	19	
20	10 34.1 +12.6	71.9	10 52.6 +13.6	72.1	11 10.9 +14.6	72.3	11 29.1 +15.6	72.5	11 47.0 +16.6	72.7	12 04.8 +17.6	72.9	12 22.4 +18.5	73.1	12 39.7 +19.5	73.3	20	12 39.7 +19.5	73.3	12 39.7 +19.5	73.3	12 39.7 +19.5	73.3	20	
21	10 46.7 +12.5	70.9	11 06.2 +13.5	71.1	11 25.5 +14.5	71.3	11 44.7 +15.4	71.5	12 03.6 +16.4	71.7	12 22.4 +17.3	71.9	12 40.9 +18.3	72.1	12 59.2 +19.3	72.3	21	12 59.2 +19.3	72.3	12 59.2 +19.3	72.3	12 59.2 +19.3	72.3	21	
22	10 59.2 +12.2	69.9	11 19.7 +13.2	70.1	11 40.0 +14.2	70.3	12 00.1 +15.2	70.5	12 20.0 +16.2	70.7	12 39.7 +17.1	70.9	12 59.2 +18.1	71.1	13 18.5 +19.1	71.4	22	13 18.5 +19.1	71.4	13 18.5 +19.1	71.4	13 18.5 +19.1	71.4	22	
23	11 11.4 +12.1	68.9	11 32.9 +13.0	69.1	11 54.2 +14.0	69.3	12 15.3 +14.9	69.5	12 36.2 +15.9	69.7	12 56.8 +16.9	69.9	13 17.3 +17.9	70.2	13 37.6 +18.8	70.4	23	13 37.6 +18.8	70.4	13 37.6 +18.8	70.4	13 37.6 +18.8	70.4	23	
24	11 23.5 +11.8	67.9	11 45.9 +12.8	68.1	12 08.2 +13.8	68.3	12 30.2 +14.8	68.5	12 52.1 +15.7	68.7	13 37.0 +16.5	68.9	13 53.6 +17.6	69.2	13 56.4 +18.6	69.4	24	13 56.4 +18.6	69.4	13 56.4 +18.6	69.4	13 56.4 +18.6	69.4	24	
25	11 35.3 +11.7	66.9	11 58.7 +12.7	67.1	12 22.0 +13.5	67.3	12 45.0 +14.5	67.5	13 07.8 +15.5	67.7	13 30.4 +16.5	68.0	13 52.8 +17.4	68.2	14 15.0 +18.4	68.4	25	14 15.0 +18.4	68.4	14 15.0 +18.4	68.4	14 15.0 +18.4	68.4	25	
26	11 47.0 +11.4	65.9	12 11.4 +12.4	66.1	12 35.5 +13.4	66.3	12 59.5 +14.3	66.5	13 23.3 +15.3	66.8	13 46.9 +16.2	67.0	14 10.2 +17.2	67.2	14 33.4 +18.1	67.4	26	14 33.4 +18.1	67.4	14 33.4 +18.1	67.4	14 33.4 +18.1	67.4	26	
27	11 58.4 +11.2	64.9	12 23.8 +12.1	65.1	12 48.9 +13.1	65.3	13 13.8 +14.1	65.4	13 38.6 +15.0	65.8	14 03.1 +16.0	66.0	14 27.4 +16.9	66.2	14 51.5 +17.8	66.5	27	14 51.5 +17.8	66.5	14 51.5 +17.8	66.5	14 51.5 +17.8	66.5	27	
28	12 09.6 +11.1	63.9	12 35.9 +12.0	64.1	13 02.0 +12.9	64.3	13 27.9 +13.8	64.5	13 49.1 +14.8	64.8	14 19.1 +15.7	65.0	14 44.3 +16.7	65.2	15 09.3 +17.6	65.5	28	15 09.3 +17.6	65.5	15 09.3 +17.6	65.5	15 09.3 +17.6	65.5	28	
29	12 20.7 +10.7	62.9	12 47.9 +11.7	63.1	13 14.9 +12.7	63.3	13 41.7 +13.5	63.5	14 47.2 +14.3	63.7	15 27.8 +9.9	63.7	18 08.3 +10.7	64.7	18 48.5 +11.5	64.8	29	18 48.5 +11.5	64.8	18 48.5 +11.5	64.8	18 48.5 +11.5	64.8	29	
30	12 31.4 +10.6	61.9	12 59.6 +10.3	62.1	13 27.6 +12.4	62.3	13 55.3 +13.4	62.5	14 22.9 +14.3	62.8	14 50.2 +15.2	63.0	15 17.4 +16.1	63.2	15 44.3 +17.0	63.5	30	15 44.3 +17.0	63.5	15 44.3 +17.0	63.5	15 44.3 +17.0	63.5	30	
31	12 42.0 +10.3	60.9	13 11.1 +11.2	61.1	13 40.0 +12.1	61.3	14 08.7 +13.1	61.5	14 37.2 +14.0	61.8	15 05.4 +15.0	62.0	15 33.5 +15.9	62.2	16 01.3 +16.8	62.5	31	16 01.3 +16.8							

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 84° , 276°

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.		
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z			
0	5 47.7 -15.7	91.6	5 46.0 -16.7	91.7	5 44.2 -17.7	91.8	5 42.3 -18.7	91.9	5 40.3 -19.7	92.0	5 38.2 -20.6	92.1	5 36.0 -21.6	92.2	5 33.7 -22.6	92.3	5 31.1 -23.7	93.2	5 29.4 -24.8	94.1	5 27.7 -25.9	95.0	5 26.0 -27.0	95.9	5 24.3 -28.1	96.9	0
1	5 32.0 -15.7	92.5	5 29.3 -16.7	92.6	5 26.5 -17.7	92.7	5 23.6 -18.7	92.8	5 20.6 -19.7	92.9	5 17.6 -20.8	93.0	5 14.4 -21.8	93.1	5 11.1 -22.7	93.2	5 8.9 -23.8	94.1	5 6.6 -24.8	95.0	5 4.4 -25.8	95.9	5 2.1 -26.9	96.0	5 0.8 -27.9	97.0	1
2	5 16.3 -15.9	93.5	5 12.6 -16.9	93.6	5 08.8 -17.9	93.7	5 04.9 -18.9	93.8	5 00.9 -19.9	93.9	4 56.8 -20.8	93.9	4 45.6 -21.8	94.0	4 34.4 -22.8	94.1	4 23.2 -23.8	95.0	4 11.9 -24.8	95.9	4 0.7 -25.9	96.0	2 30.8 -23.2	97.0	2		
3	5 00.4 -15.9	94.5	4 55.7 -16.9	94.6	4 50.9 -17.9	94.6	4 46.0 -18.9	94.7	4 41.0 -19.9	94.8	4 36.0 -20.9	94.9	4 30.8 -21.9	95.0	4 20.9 -22.9	95.9	4 10.7 -23.9	96.0	4 0.6 -24.9	97.0	3 30.8 -23.0	98.0	3				
4	4 44.5 -16.0	95.4	4 38.8 -17.0	95.5	4 33.0 -18.0	95.6	4 27.1 -19.0	95.7	4 21.1 -20.0	95.8	4 15.1 -21.0	95.8	4 8.9 -22.0	95.9	4 0.7 -23.0	96.0	4 20.7 -22.9	97.0	4 10.6 -23.9	98.0	4 0.5 -24.9	99.0	4 0.2 -25.9	100.0	4		
5	4 28.5 -16.1	96.4	4 21.8 -17.1	96.5	4 15.0 -18.1	96.6	4 08.1 -19.1	96.6	4 01.1 -20.0	96.7	3 54.1 -21.0	96.8	3 47.0 -22.0	96.8	3 39.8 -23.0	96.9	3 32.6 -24.0	97.0	3 25.4 -25.0	98.0	3 18.6 -26.0	99.0	3 11.4 -27.0	100.0	5		
6	4 12.4 -16.1	97.4	4 04.7 -17.2	97.4	3 56.9 -18.2	97.5	3 49.0 -19.1	97.6	3 41.1 -20.2	97.6	3 33.1 -21.1	97.7	3 25.0 -22.1	97.8	3 16.8 -23.0	97.8	3 8.6 -24.0	98.0	3 0.4 -25.0	99.0	3 23.8 -26.0	100.0	6				
7	3 56.3 -16.3	98.3	3 47.5 -17.2	98.4	3 38.7 -18.2	98.5	3 29.9 -19.2	98.5	3 20.9 -20.1	98.6	3 12.0 -21.2	98.6	3 02.9 -22.1	98.7	2 53.8 -23.0	98.7	2 30.8 -24.0	99.7	2 13.0 -25.0	100.0	2 0.8 -26.0	101.0	2				
8	3 40.0 -16.2	99.3	3 30.3 -17.3	99.4	3 20.5 -18.2	99.4	3 10.7 -19.3	99.5	3 00.8 -20.2	99.5	2 50.8 -21.2	99.6	2 40.8 -22.1	99.6	2 30.8 -23.2	99.7	2 13.0 -24.2	100.0	2 0.8 -25.2	101.0	2 20.7 -26.0	102.0	8				
9	3 23.8 -16.4	100.3	3 13.0 -17.3	100.3	3 02.3 -18.4	100.4	2 51.4 -19.3	100.4	2 40.6 -20.3	100.5	2 29.6 -21.2	100.5	2 18.7 -22.2	100.6	2 07.6 -23.1	100.6	2 0.7 -24.1	101.0	2 19.7 -25.0	102.0	2 0.7 -26.0	103.0	9				
10	3 07.4 -16.4	101.2	2 55.7 -17.4	101.3	2 43.9 -18.3	101.3	2 32.1 -19.3	101.4	2 20.3 -20.3	101.4	2 08.4 -21.3	101.5	1 56.5 -22.2	101.5	1 44.5 -23.2	101.5	1 21.3 -24.2	102.4	1 0.7 -25.2	103.4	1 20.7 -26.0	104.4	10				
11	2 51.0 -16.4	102.2	2 38.3 -17.4	102.2	2 25.6 -18.4	102.3	2 12.8 -19.4	102.3	2 00.0 -20.3	102.4	1 47.1 -21.3	102.4	1 34.3 -22.3	102.4	1 21.1 -23.2	102.4	1 0.7 -24.2	103.4	1 20.7 -25.0	104.4	1 11.7 -26.0	105.4	11				
12	2 34.6 -16.5	103.2	2 20.9 -17.5	103.2	2 07.2 -18.4	103.2	1 53.4 -19.4	103.3	1 39.7 -20.4	103.3	1 25.8 -21.3	103.3	1 12.0 -22.3	103.3	0 58.1 -23.2	103.4	0 34.9 -24.2	104.3	0 11.7 -25.2	105.3	0 20.7 -26.0	106.3	12				
13	2 18.1 -16.5	104.1	2 03.4 -17.5	104.2	1 48.8 -18.5	104.2	1 34.0 -19.4	104.2	1 19.3 -20.4	104.2	1 04.5 -21.3	104.3	0 49.7 -22.2	104.3	0 27.5 -23.2	105.2	0 11.7 -24.2	106.2	0 20.7 -25.0	107.2	0 11.7 -26.0	108.2	13				
14	2 01.6 -16.6	105.1	1 45.9 -17.5	105.1	1 30.3 -18.5	105.1	1 14.6 -19.4	105.2	0 58.9 -20.4	105.2	0 43.2 -21.3	105.2	0 27.5 -22.3	105.2	0 11.7 -23.2	105.2	0 20.7 -24.0	106.2	0 11.7 -25.0	107.2	0 20.7 -26.0	108.2	14				
15	1 45.0 -16.6	106.0	1 28.4 -17.5	106.1	1 11.8 -18.5	106.1	0 55.2 -19.5	106.1	0 38.5 -20.4	106.1	0 21.9 -21.4	106.1	0 0.5 -22.3	106.1	0 11.5 -23.2	107.1	0 34.7 -24.2	108.1	0 17.1 -25.2	109.1	0 30.5 -26.0	110.1	15				
16	1 28.4 -16.6	107.0	1 10.9 -17.6	107.0	0 53.3 -18.5	107.0	0 35.7 -19.5	107.1	0 0.5 -20.5	107.1	0 17.1 -22.3	107.1	0 57.9 -23.2	107.2	0 34.7 -23.2	108.2	0 17.1 -24.2	109.2	0 30.5 -25.0	110.2	0 17.1 -26.0	111.2	16				
17	1 11.8 -16.6	108.0	0 53.3 -17.6	108.0	0 34.8 -18.6	108.0	0 16.2 -19.4	108.0	0 0.3 -22.3	108.1	0 22.7 -24.0	108.1	0 57.9 -23.2	109.1	0 23.9 -24.0	110.1	0 12.1 -25.0	111.1	0 21.1 -26.0	112.1	0 12.1 -27.0	113.1	17				
18	0 55.2 -16.7	108.9	0 35.7 -17.6	108.9	0 16.2 -18.5	108.9	0 0.3 -22.3	109.0	0 2.3 -23.8	109.0	0 43.1 -24.0	109.1	0 13.5 -25.0	109.1	0 23.9 -26.0	110.1	0 12.0 -27.0	111.1	0 21.3 -28.0	112.1	0 12.0 -29.0	113.1	18				
19	0 38.5 -16.6	109.9	0 18.1 -17.6	109.9	0 0.2 -18.5	110.0	0 22.7 -19.5	109.9	0 4.3 -23.8	110.0	0 43.1 -24.0	110.1	0 13.5 -25.0	110.1	0 23.9 -26.0	111.1	0 12.0 -27.0	112.1	0 21.3 -28.0	113.1	0 12.0 -29.0	114.1	19				
20	0 21.9 -16.7	110.8	0 0.0 -17.6	110.8	0 20.8 +18.6	69.2	0 42.2 +19.4	69.2	1 03.5 +20.4	69.2	1 24.8 +21.3	69.2	1 46.1 +22.2	69.2	2 07.4 +23.1	69.3	2 30.5 +23.1	68.3	2 30.5 +24.1	67.3	2 30.5 +25.1	66.3	2 30.5 +26.1	65.3	20		
21	0 0.5 -16.7	111.8	0 17.1 +17.6	68.2	0 39.4 +18.5	68.2	1 01.6 +19.5	68.2	1 23.9 +20.4	68.2	1 46.1 +21.3	68.2	2 08.3 +22.2	68.3	2 30.5 +23.1	67.3	2 30.5 +24.1	66.3	2 30.5 +25.1	65.3	2 30.5 +26.1	64.3	2 30.5 +27.1	63.3	21		
22	0 11.5 +16.6	67.2	0 34.7 +17.6	67.2	0 57.9 +18.5	67.3	1 21.1 +19.4	67.3	1 44.3 +20.3	67.3	2 07.4 +21.2	67.3	2 30.5 +22.1	67.4	2 30.5 +23.1	66.4	2 30.5 +24.1	65.4	2 30.5 +25.1	64.4	2 30.5 +26.1	63.4	2 30.5 +27.1	62.4	22		
23	0 28.1 +16.7	66.3	0 52.3 +17.6	66.3	1 16.4 +18.5	66.3	1 40.5 +19.4	66.3	2 04.6 +20.3	66.4	2 28.6 +21.2	66.4	2 52.6 +22.1	66.4	3 16.6 +23.0	65.5	3 39.6 +22.9	65.5	3 39.6 +23.9	64.5	3 39.6 +24.9	63.5	3 39.6 +25.9	62.5	23		
24	0 44.8 +16.7	65.3	1 09.9 +17.5	65.3	1 34.9 +18.4	65.4	1 59.9 +19.4	65.4	2 24.9 +20.2	65.4	2 49.8 +21.2	65.5	3 14.7 +22.1	65.5	3 39.6 +22.9	64.5	3 39.6 +23.9	63.5	3 39.6 +24.9	62.5	3 39.6 +25.9	61.5	3 39.6 +26.9	60.5	24		
25	1 01.5 +16.6	64.4	1 27.4 +17.5	64.4	1 53.3 +18.5	64.4	2 19.3 +19.3	64.4	2 45.1 +20.2	64.5	3 11.0 +21.1	64.5	3 36.8 +21.9	64.6	4 02.5 +22.8	64.6	4 20.1 +23.8	64.7	4 20.1 +24.8	63.7	4 20.1 +25.8	62.7	4 20.1 +26.8	61.7	25		
26	1 18.1 +16.6	63.4	1 44.9 +17.5	63.4	2 11.8 +18.4	63.4	2 38.6 +19.3	63.5	3 05.3 +20.2	63.5	3 32.1 +21.0	63.6	3 58.7 +21.9	63.6	4 25.3 +22.8	63.7	4 25.3 +23.8	62.7	4 25.3 +24.8	61.7	4 25.3 +25.8	60.7	26				
27	1 34.7 +16.6	62.4	2 02.4 -17.5	62.5	2 30.2 +18.3	62.5	2 57.9 +19.2	62.5	3 25.5 +20.1	62.6	3 53.1 +21.0	62.6	4 20.6 +21.9	62.7	4 48.1 +22.7	62.8	4 48.1 +23.7	61.8	4 48.1 +24.7	60.8	4 48.1 +25.7	59.8	27				
28	1 51.3 +16.5	61.5	2 19.9 +17.4	61.5	2 48.5 +18.3	61.5	3 17.1 +19.2	61.6	3 45.6 +20.1	61.6	4 14.1 +21.0	61.6	4 42.5 +21.9	61.6	5 10.8 +22.9	61.6	5 30.5 +23.9	60.6	5 30.5 +24.9	60.6	5 30.5 +25.9	60.6	5 30.5 +26.9	60.6	28		
29	2 07.8 +16.5	60.5	2 37.3 +17.4	60.5	2 36.8 +18.3	60.6	3 36.3 +19.1	60.6	4 05.7 +19.9	60.7	4 35.0 +20.8	60.8	5 04.3 +21.6	60.8	5 33.5 +22.5	60.9	5 33.5 +23.5	60.9	5 33.5 +24.5	60.9	5 33.5 +25.5	60.9	5 33.5 +26.5	60.9	29		
30	2 24.3 +16.5	59.5	2 54.7 +17.4	59.6	3 25.1 +18.2	59.6	3 55.4 +19.0	59.7	4 25.6 +19.9	59.8	4 55.8 +20.8	59.8	5 25.9 +21.6	59.9	5 56.0 +22.4	60.0	5 56.0 +23.4	60.0	5 56.0 +24.4	60.0	5 56.0 +25.4	60.0	5 56.0 +26.4	60.0	30		
31	2 40.8 +16.4	58.6	3 12.1 +17.2	58.6	3 43.3 +18.1	58.7	4 14.4 +19.0	58.7	4 45.5 +19.9	58.8	5 16.6 +20.6	58.9	5 47.5 +21.6														

85°, 275° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180°Zn=7
L.H.A. less than 180°Zn=360°-Z

Dec.	15°			16°			17°			18°			19°			20°			21°			Dec.			
	Hc	d	Z																						
0	4 49.8	+15.5	91.3	4 48.4	+16.5	91.4	4 46.9	+17.5	91.5	4 45.3	+18.5	91.5	4 43.6	+19.6	91.6	4 41.9	+20.5	91.7	4 40.0	+21.6	91.8	4 38.1	+22.5	91.9	0
1	5 05.3	+15.5	90.3	5 04.9	+16.5	90.4	5 04.4	+17.5	90.5	5 03.8	+18.5	90.6	5 03.2	+19.5	90.7	5 02.4	+20.5	90.8	5 01.6	+21.4	90.9	5 00.6	+22.5	90.9	1
2	5 20.8	+15.3	89.4	5 21.4	+16.4	89.5	5 21.9	+17.4	89.5	5 22.3	+18.4	89.6	5 22.7	+19.3	89.7	5 22.9	+20.4	89.8	5 23.0	+21.4	89.9	5 23.1	+22.3	90.0	2
3	5 36.1	+15.3	88.4	5 37.8	+16.2	88.5	5 39.3	+17.3	88.6	5 40.7	+18.3	88.7	5 42.0	+19.3	88.8	5 43.3	+20.3	88.9	5 44.4	+21.3	89.0	5 45.4	+22.3	89.1	3
4	5 51.4	+15.2	87.4	5 54.0	+16.2	87.5	5 56.6	+17.2	87.6	5 59.0	+18.2	87.7	6 01.3	+19.2	87.8	6 03.6	+20.2	87.9	6 05.7	+21.1	88.0	6 07.7	+22.1	88.1	4
5	6 06.6	+15.0	86.4	6 10.2	+16.1	86.5	6 13.8	+17.1	86.7	6 17.2	+18.1	86.8	6 20.5	+19.1	86.9	6 23.8	+20.0	87.0	6 26.8	+21.1	87.1	6 29.8	+22.1	87.2	5
6	6 21.6	+15.0	85.5	6 26.3	+16.0	85.6	6 30.9	+16.9	85.7	6 35.3	+18.0	85.8	6 39.6	+19.0	85.9	6 43.8	+20.0	86.0	6 47.9	+21.0	86.2	6 51.9	+21.9	86.3	6
7	6 36.6	+14.8	84.5	6 42.3	+15.8	84.6	6 47.8	+16.9	84.7	6 53.3	+17.9	84.8	6 58.6	+18.9	85.0	7 03.8	+19.9	85.1	7 08.9	+20.8	85.2	7 13.8	+21.9	85.3	7
8	6 51.4	+14.7	83.5	6 58.1	+15.8	83.6	7 04.7	+16.7	83.8	7 11.2	+17.7	83.9	7 17.5	+18.7	84.0	7 23.7	+19.7	84.1	7 29.7	+20.8	84.3	7 35.7	+21.7	84.4	8
9	7 06.1	+14.6	82.5	7 13.9	+15.6	82.7	7 21.4	+16.7	82.8	7 28.9	+17.6	82.9	7 36.2	+18.7	83.1	7 43.4	+19.6	83.2	7 50.5	+20.6	83.3	7 57.4	+21.6	83.5	9
10	7 20.7	+14.5	81.6	7 29.5	+15.4	81.7	7 38.1	+16.5	81.8	7 46.5	+17.5	82.0	7 54.9	+18.4	82.1	8 03.0	+19.5	82.2	8 11.1	+20.4	82.4	8 19.0	+21.4	82.5	10
11	7 35.2	+14.3	80.6	7 44.9	+15.4	80.7	7 54.6	+16.3	80.9	8 04.0	+17.4	81.0	8 13.3	+18.4	81.1	8 22.5	+19.4	81.3	8 31.5	+20.4	81.4	8 40.4	+21.3	81.6	11
12	7 49.5	+14.2	79.6	8 00.3	+15.2	79.7	8 10.9	+16.2	79.9	8 21.4	+17.2	80.0	8 31.7	+18.2	80.2	8 41.9	+19.2	80.3	8 51.9	+20.2	80.5	9 01.7	+21.2	80.6	12
13	8 03.7	+14.1	78.6	8 15.5	+15.1	78.8	8 27.1	+16.1	78.9	8 38.6	+17.1	79.1	8 49.9	+18.1	79.2	9 01.1	+19.0	79.4	9 12.1	+20.0	79.5	9 22.9	+21.0	79.7	13
14	8 17.8	+13.9	77.6	8 30.6	+14.9	77.8	8 43.2	+15.9	77.9	8 55.7	+16.9	78.1	9 08.0	+17.9	78.2	9 20.1	+18.9	78.4	9 32.1	+19.9	78.6	9 43.9	+20.9	78.7	14
15	8 31.7	+13.8	76.7	8 45.5	+14.8	76.8	8 59.1	+15.8	77.0	9 12.6	+16.7	77.1	9 25.9	+17.7	77.3	9 39.0	+18.7	77.4	9 52.0	+19.7	77.6	10 04.8	+20.7	77.8	15
16	8 45.5	+13.6	75.7	9 00.3	+14.6	75.8	9 14.9	+15.6	76.0	9 29.3	+16.6	76.1	9 43.6	+17.6	76.3	9 57.7	+18.6	76.5	10 11.7	+19.5	76.6	10 25.5	+20.5	76.8	16
17	8 59.1	+13.5	74.7	9 14.9	+14.4	74.8	9 30.5	+15.4	75.0	9 45.9	+16.5	75.2	10 01.2	+17.4	75.3	10 16.3	+18.4	75.5	10 31.2	+19.4	75.7	10 46.0	+20.3	75.9	17
18	9 12.6	+13.3	73.7	9 29.3	+14.3	73.9	9 45.9	+15.3	74.0	10 02.4	+16.2	74.2	10 18.6	+17.3	74.4	10 34.7	+18.2	74.5	10 50.6	+19.2	74.7	11 06.3	+20.2	74.9	18
19	9 25.9	+13.1	72.7	9 43.6	+14.1	72.9	10 01.2	+15.1	73.0	10 18.6	+16.1	73.2	10 35.9	+17.0	73.4	10 52.9	+18.1	73.6	11 09.8	+19.0	73.8	11 26.5	+20.0	73.9	19
20	9 39.0	+13.0	71.7	9 57.7	+14.0	71.9	10 16.3	+14.9	72.1	10 34.7	+15.9	72.2	10 52.9	+16.9	72.4	11 11.0	+17.8	72.6	11 28.8	+18.8	72.8	11 46.5	+19.7	73.0	20
21	9 52.0	+12.8	70.7	10 11.7	+13.8	70.9	10 31.2	+14.8	71.1	10 50.6	+15.7	71.3	11 09.8	+16.7	71.4	11 28.8	+17.7	71.6	11 47.6	+18.6	71.8	12 06.2	+19.6	72.0	21
22	10 04.8	+12.6	69.7	10 25.5	+13.5	69.9	10 46.0	+14.5	70.1	11 06.3	+15.5	70.3	11 26.5	+16.5	70.5	11 46.5	+17.4	70.6	12 06.2	+18.5	70.8	12 25.8	+19.4	71.1	22
23	10 17.4	+12.4	68.7	10 39.0	+13.4	68.9	11 00.5	+14.4	69.1	11 21.8	+15.4	69.3	11 43.0	+16.3	69.5	12 03.9	+17.3	69.7	12 24.7	+18.2	69.9	12 45.2	+19.2	70.1	23
24	10 29.8	+12.2	67.8	10 52.4	+13.2	67.9	11 14.9	+14.2	68.1	11 37.2	+15.1	68.3	11 59.3	+16.1	68.5	12 21.2	+17.0	68.7	12 42.9	+18.0	68.9	13 04.4	+18.9	69.1	24
25	10 42.0	+12.1	66.8	11 05.6	+13.1	66.9	11 29.1	+13.9	67.1	11 52.3	+14.9	67.3	12 15.4	+15.8	67.5	12 38.2	+16.8	67.7	13 00.9	+17.7	67.9	13 23.3	+18.7	68.1	25
26	10 54.1	+11.8	65.8	11 18.7	+12.8	65.9	11 43.0	+13.8	66.1	12 07.2	+14.7	66.3	12 31.2	+15.7	66.5	12 55.0	+16.6	66.7	13 18.6	+17.6	66.9	13 42.0	+18.5	67.2	26
27	11 06.0	+11.6	64.8	11 31.5	+12.6	64.9	11 56.8	+13.5	65.1	12 21.9	+14.5	65.3	12 46.9	+15.4	65.5	13 11.6	+16.4	65.7	13 36.2	+17.3	66.0	14 00.5	+18.3	66.2	27
28	11 17.6	+11.5	63.8	11 44.1	+12.4	63.9	12 10.3	+13.4	64.1	12 36.4	+14.3	64.3	13 02.3	+15.2	64.5	13 28.0	+16.1	64.8	13 53.5	+17.1	65.0	14 18.8	+18.0	65.2	28
29	11 29.1	+11.2	62.8	11 56.5	+12.2	62.9	12 23.7	+13.1	63.1	12 50.7	+14.0	63.3	13 17.5	+15.0	63.5	13 44.1	+16.0	63.8	14 10.6	+16.8	64.0	14 36.8	+17.7	64.2	29
30	11 40.3	+11.1	61.8	12 08.7	+11.9	61.9	12 36.8	+12.9	62.1	13 04.7	+13.9	62.3	13 32.5	+14.7	62.5	14 00.1	+15.6	62.8	14 27.4	+16.6	63.0	14 54.5	+17.6	63.2	30
31	11 51.4	+10.8	60.8	12 20.6	+11.8	60.9	12 49.7	+12.6	61.1	13 18.6	+13.5	61.3	13 47.2	+14.5	61.5	14 15.7	+15.4	61.8	14 44.0	+16.3	62.0	15 12.1	+17.2	62.2	31
32	12 02.2	+10.7	59.7	12 32.4	+11.5	59.9	13 02.3	+12.5	60.1	13 32.1	+13.4	60.3	14 01.7	+14.3	60.6	14 31.1	+15.2	60.8	15 00.3	+16.1	61.0	15 29.3	+17.0	61.2	32
33	12 12.9	+10.4	58.7	12 43.9	+11.3	58.9	13 14.8	+12.2	59.1	13 45.5	+13.1	59.3	14 16.0	+14.0	59.5	14 46.3	+14.9	59.8	15 16.4	+15.8	60.0	15 46.3	+16.7	60.2	33
34	12 23.3	+10.1	57.7	12 55.2	+11.1	57.9	13 27.0	+11.9	58.1	13 58.6	+12.8	58.3	14 30.0	+11.3	58.5	15 01.2	+14.6	58.8	15 32.2	+15.5	59.0	16 03.0	+16.4	59.2	34
35	12 33.4	+10.0	56.7	13 06.3	+10.8	56.9	13 38.9	+11.7	57.1	14 11.4	+12.6	57.3	14 43.7	+13.5	57.5	15 15.8	+14.4	57.8	15 47.7	+15.3	58.0	16 19.4	+16.2	58.2	35
36	12 43.4	+9.7	55.7	13 17.1	+10.6	55.9	13 50.6	+11.5	56.1	14 24.0	+12.4	56.3	14 57.2	+13.2	56.5	15 30.2	+14.1	56.8	16 03.0	+15.0	57.0	16 35.6	+15.8	57.2	36
37	12 53.1	+9.5	54.7	13 27.7	+10.3	54.9	14 21.2	+11.2	55.1	14 36.4	+12.0	55.3	15 10.4	+13.0	55.5	14 44.3	+13.8	55.7	16 18.0	+14.6	56.0	16 51.4	+15.6	56.2	37
38	13 02.6	+9.2	53.7	15 07.4	+7.5	53.7	15 50.7	+8.2	53.9	16 33.9	+9.0	54.1													

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 85° , 275°

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.			
	Hc	d	Z																									
0	4 49.8	-15.7	91.3	4 48.4	-16.7	91.4	4 46.9	-17.7	91.5	4 45.3	-18.7	91.5	4 43.6	-19.6	91.6	4 41.9	-20.7	91.7	4 40.0	-21.6	91.8	4 38.1	-22.6	91.9	0			
1	4 34.1	-15.7	92.3	4 31.7	-16.7	92.3	4 29.2	-17.7	92.4	4 26.6	-18.7	92.5	4 24.0	-19.7	92.6	4 21.2	-20.7	92.7	4 18.4	-21.7	92.7	4 15.5	-22.6	92.8	1			
2	4 18.4	-15.8	93.2	4 15.0	-16.8	93.3	4 11.5	-17.8	93.4	4 07.9	-18.8	93.5	4 04.3	-19.8	93.5	4 00.5	-20.7	93.6	3 56.7	-21.7	93.7	3 52.9	-22.7	93.7	2			
3	4 02.6	-15.8	94.2	3 58.2	-16.8	94.3	3 53.7	-17.8	94.3	3 49.1	-18.8	94.4	3 44.5	-19.8	94.5	3 39.8	-20.8	94.5	3 35.0	-21.8	94.6	3 30.2	-22.8	94.7	3			
4	3 46.8	-15.9	95.2	3 41.4	-16.9	95.2	3 35.9	-18.0	95.3	3 30.3	-18.9	95.4	3 24.7	-19.9	95.4	3 19.0	-20.9	95.5	3 13.2	-21.8	95.5	3 07.4	-22.8	95.6	4			
5	3 30.9	-16.0	96.1	3 24.5	-17.0	96.2	3 17.9	-17.9	96.3	3 11.4	-19.0	96.3	3 04.8	-20.0	96.4	2 58.1	-20.9	96.5	2 51.4	-21.9	96.5	2 44.6	-22.9	96.5	5			
6	3 14.9	-16.0	97.1	3 07.5	-17.0	97.2	3 00.0	-18.0	97.2	2 52.4	-19.0	97.3	2 44.8	-20.0	97.3	2 37.2	-21.0	97.4	2 29.5	-22.0	97.4	2 21.7	-22.9	97.4	6			
7	2 58.9	-16.1	98.1	2 50.5	-17.1	98.1	2 42.0	-18.1	98.2	2 33.4	-19.0	98.2	2 24.8	-20.0	98.3	2 16.2	-21.0	98.3	2 07.5	-21.9	98.3	1 58.8	-22.9	98.4	7			
8	2 42.8	-16.1	99.0	2 33.4	-17.1	99.1	2 23.9	-18.1	99.1	2 14.4	-19.1	99.2	2 04.8	-20.1	99.2	1 55.2	-21.0	99.2	1 45.6	-22.0	99.3	1 35.9	-23.0	99.3	8			
9	2 26.7	-16.2	100.0	2 16.3	-17.2	100.0	2 05.8	-18.1	100.1	1 55.3	-19.1	100.1	1 44.7	-20.1	100.1	1 34.2	-21.1	100.2	1 23.6	-22.1	100.2	1 12.9	-22.9	100.2	9			
10	2 10.5	-16.2	101.0	1 59.1	-17.2	101.0	1 47.7	-18.2	101.0	1 36.2	-19.2	101.1	1 24.6	-20.1	101.1	1 13.1	-21.1	101.1	1 01.5	-22.0	101.1	0 50.0	-23.0	101.1	10			
11	1 54.3	-16.2	101.9	1 41.9	-17.2	102.0	1 29.5	-18.2	102.0	1 17.0	-19.1	102.0	1 04.5	-20.1	102.0	0 52.0	-21.1	102.0	0 39.5	-22.0	102.1	0 27.0	-23.0	102.1	11			
12	1 38.1	-16.3	102.9	1 24.7	-17.2	102.9	1 11.3	-18.2	102.9	0 57.9	-19.2	103.0	0 44.4	-20.1	103.0	0 30.9	-21.1	103.0	0 17.5	-22.1	103.0	0 04.0	-23.0	103.0	12			
13	1 21.8	-16.2	103.8	1 07.5	-17.3	103.9	0 53.1	-18.2	103.9	0 38.7	-19.2	103.9	0 24.3	-20.2	103.9	0 09.8	-21.1	103.9	0 04.6	-22.0	76.1	0 19.0	-23.0	76.1	13			
14	1 05.6	-16.3	104.8	0 50.2	-17.3	104.8	0 34.9	-18.3	104.8	0 19.5	-19.2	104.8	0 04.1	-20.1	104.8	0 16.0	+20.2	74.2	0 32.4	+21.0	74.2	1 05.0	+22.9	74.2	15			
15	0 49.3	-16.4	105.8	0 32.9	-17.2	105.8	0 16.6	-18.2	105.8	0 00.3	-19.2	105.8	0 01.6	+18.3	73.3	0 36.2	+20.1	73.3	0 53.4	+21.1	73.3	1 10.7	+22.0	73.3	1 27.9	+23.0	73.3	16
16	0 32.9	-16.3	106.7	0 15.7	-17.3	106.7	0 01.6	+17.3	72.3	0 19.9	+18.2	72.3	0 56.3	+20.1	72.3	1 44.5	+21.1	72.3	1 32.7	+22.0	72.4	1 50.9	+22.9	72.4	17			
17	0 16.6	-16.3	107.7	0 00.3	-16.3	107.7	0 18.9	+17.3	71.3	0 38.1	+18.2	71.4	0 57.3	+19.1	71.4	1 16.4	+20.1	71.4	1 54.7	+21.9	71.4	2 13.8	+22.9	71.5	18			
18	0 0.0	-16.3	108.7	0 36.2	+17.2	70.4	0 56.3	+18.2	70.4	1 16.4	+19.2	70.4	1 36.5	+20.1	70.4	1 56.6	+21.0	70.5	2 16.6	+22.0	70.5	2 36.7	+22.8	70.5	19			
19	0 16.0	+16.4	70.4	0 36.2	+17.2	70.4	0 56.3	+18.2	70.4	1 16.4	+19.2	70.4	1 36.5	+20.1	70.4	1 56.6	+21.0	70.5	2 16.6	+22.0	70.5	2 36.7	+22.8	70.5	19			
20	0 32.4	+16.3	69.4	0 53.4	+17.3	69.4	1 14.5	+18.2	69.4	1 35.6	+19.1	69.5	1 56.6	+20.0	69.5	2 17.6	+21.0	69.5	2 38.6	+21.8	69.6	2 59.5	+22.8	69.6	20			
21	0 48.7	+16.3	68.5	1 10.7	+17.2	68.5	1 32.7	+18.2	68.5	1 54.7	+19.1	68.5	2 16.6	+20.1	68.6	2 38.6	+20.9	68.6	3 00.4	+21.9	68.6	3 22.3	+22.7	68.7	21			
22	1 05.0	+16.3	67.5	1 27.9	+17.2	67.5	1 50.9	+18.1	67.5	2 13.8	+19.0	67.6	2 36.7	+19.9	67.6	2 59.5	+20.9	67.7	3 22.3	+21.7	67.7	3 45.0	+22.7	67.8	22			
23	1 21.3	+16.2	66.5	1 45.1	+17.2	66.6	2 09.0	+18.1	66.6	2 32.8	+19.0	66.6	2 56.6	+19.9	66.7	3 20.4	+20.8	66.7	3 44.0	+21.8	66.8	4 07.7	+22.6	66.8	23			
24	1 37.5	+16.3	65.6	2 02.3	+17.2	65.6	2 27.1	+18.1	65.6	2 51.8	+19.0	65.7	3 16.5	+19.9	65.7	4 41.2	+20.7	65.8	4 05.8	+21.6	65.8	4 30.3	+22.5	65.9	24			
25	1 53.8	+16.2	64.6	2 19.5	+17.1	64.6	2 45.2	+18.0	64.7	3 10.8	+18.9	64.7	3 36.4	+19.8	64.8	4 01.9	+20.7	64.8	4 27.4	+21.6	64.9	4 52.8	+22.5	65.0	25			
26	2 10.0	+16.1	63.6	2 36.6	+17.0	63.7	3 03.2	+17.9	63.7	3 29.7	+18.9	63.8	3 56.2	+19.7	63.8	4 22.6	+20.6	63.9	4 49.0	+21.5	64.0	5 15.3	+22.4	64.0	26			
27	2 26.1	+16.1	62.7	2 53.6	+17.1	62.7	3 21.1	+17.9	62.8	3 48.6	+18.7	62.8	4 15.9	+19.7	62.9	4 43.2	+20.6	63.0	5 10.5	+21.4	63.0	5 37.7	+22.3	63.1	27			
28	2 42.2	+16.1	61.7	3 10.7	+16.9	61.8	3 39.0	+17.9	61.8	4 07.3	+18.8	61.9	4 35.6	+19.6	61.9	5 03.8	+20.5	62.0	5 31.9	+21.3	62.1	6 00.0	+22.2	62.2	28			
29	2 58.3	+16.0	60.7	3 27.6	+16.8	60.8	3 56.9	+17.7	60.9	4 26.1	+18.6	60.9	4 55.2	+19.5	61.0	5 24.3	+20.3	61.1	5 53.2	+21.3	61.2	6 22.2	+22.0	61.2	29			
30	3 14.3	+16.0	59.8	3 44.5	+16.9	59.8	4 14.6	+17.7	59.9	4 44.7	+18.6	60.0	5 14.7	+19.4	60.0	5 44.6	+20.3	60.1	6 14.5	+21.1	60.2	6 44.2	+22.0	60.3	30			
31	3 30.3	+15.9	58.8	4 01.4	+16.7	58.9	4 32.3	+17.7	58.9	5 03.3	+18.5	59.0	5 34.1	+19.4	59.1	6 04.9	+20.2	59.2	6 35.6	+21.1	59.3	7 06.2	+21.9	59.4	31			
32	3 46.2	+15.9	57.8	4 18.1	+16.7	57.9	4 50.0	+17.5	58.0	5 21.8	+18.4	58.1	5 53.5	+19.2	58.1	6 25.1	+20.1	58.2	6 56.7	+20.9	58.3	7 28.1	+21.8	58.4	32			
33	4 02.1	+15.8	56.9	4 34.8	+16.7	56.9	5 07.5	+17.5	57.0	5 40.2	+18.3	57.1	6 12.7	+19.1	57.2	6 45.2	+20.0	57.3	7 17.6	+20.8	57.4	7 49.9	+21.6	57.5	33			
34	4 17.9	+15.7	55.9	4 51.5	+16.5	56.0	5 25.0	+17.4	56.1	5 58.5	+18.2	56.1	6 31.8	+19.1	56.2	7 38.4	+20.7	56.4	8 11.5	+21.5	56.6	8 33.0	+21.4	56.6	34			
35	4 33.6	+15.6	54.9	5 08.0	+16.4	55.0	5 42.4	+17.2	55.1	6 16.7	+18.1	55.1	6 50.9	+18.9	55.3	7 25.0	+19.7	55.4	7 59.1	+20.5	55.5	8 33.0	+21.4	55.6	35			
36	4 49.2	+15.5	54.0	5 24.4	+16.4	54.1	5 59.6	+17.2	54.1	6 34.8	+17.9	54.2	7 09.8	+18.8	54.3	7 44.7	+19.6	54.4	8 19.6	+20.4	54.5	8 54.4	+21.2	54.7	36			
37	5 04.7	+15.5	53.0	5 40.8	+16.3	53.1	6 16.8	+17.1	53.2	6 52.7	+17.9	53.3	7 28.6	+18.7	53.4	8 04.3	+19.5	53.5	9 40.0	+20.3	53.6	9 15.6	+21.0	53.7	37			
38	5 20.2	+15.4	52.0	5 57.1	+16.1	52.1	6 33.9	+16.9	52.2	7 10.6	+17.8	52.3	7 47.3	+18.5	52.4	8 23.8												

86°, 274° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180°Zn=7
L.H.A. less than 180°Zn=360°-Z

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	
0	3 51.8 +15.5	91.0	3 50.7 +16.5	91.1	3 49.5 +17.5	91.2	3 48.2 +18.6	91.2	3 46.9 +19.5	91.3	3 45.5 +20.5	91.4	3 44.0 +21.6	91.4	3 42.5 +22.5	91.5	3 40.0 +23.5	91.5	3 38.7 +24.5	91.6	3 37.4 +25.5	91.6	3 36.2 +26.5	91.6	0
1	4 07.3 +15.5	90.1	4 07.2 +16.5	90.1	4 07.0 +17.5	90.2	4 06.8 +18.5	90.3	4 06.4 +19.5	90.4	4 06.0 +20.5	90.4	4 05.6 +21.4	90.5	4 05.0 +22.4	90.6	4 04.5 +23.4	90.6	4 04.0 +24.4	90.6	4 03.5 +25.4	90.6	4 03.0 +26.4	90.6	1
2	4 22.8 +15.4	89.1	4 23.7 +16.4	89.2	4 24.5 +17.4	89.3	4 25.3 +18.4	89.3	4 25.9 +19.4	89.4	4 26.5 +20.4	89.5	4 27.0 +21.4	89.6	4 27.4 +22.4	89.6	4 27.8 +23.4	89.6	4 28.2 +24.4	89.6	4 28.6 +25.4	89.6	4 29.0 +26.4	89.6	2
3	4 38.2 +15.3	88.1	4 40.1 +16.3	88.2	4 41.9 +17.4	88.3	4 43.7 +18.3	88.4	4 45.3 +19.4	88.5	4 46.9 +20.3	88.5	4 48.4 +21.3	88.6	4 49.8 +22.3	88.7	4 51.2 +23.3	88.7	4 52.6 +24.3	88.7	4 54.0 +25.3	88.7	4 55.4 +26.3	88.7	3
4	4 53.5 +15.2	87.2	4 56.4 +16.3	87.2	4 59.3 +17.2	87.3	5 02.0 +18.3	87.4	5 04.7 +19.2	87.5	5 07.2 +20.3	87.6	5 09.7 +21.2	87.7	5 12.1 +22.2	87.8	5 14.5 +23.2	87.8	5 16.9 +24.2	87.8	5 19.3 +25.2	87.8	5 21.7 +26.2	87.8	4
5	5 08.7 +15.1	86.2	5 12.7 +16.1	86.3	5 16.5 +17.2	86.4	5 20.3 +18.1	86.5	5 23.9 +19.2	86.6	5 27.5 +20.1	86.7	5 30.9 +21.1	86.7	5 34.3 +22.1	86.8	5 37.7 +23.1	86.8	5 41.1 +24.1	86.8	5 44.5 +25.1	86.8	5 47.9 +26.1	86.8	5
6	5 23.8 +15.1	85.2	5 28.8 +16.1	85.3	5 33.7 +17.0	85.4	5 38.4 +18.1	85.5	5 43.1 +19.0	85.6	5 47.6 +20.1	85.7	5 52.0 +21.1	85.8	5 56.4 +22.0	85.9	5 60.8 +23.0	85.9	5 65.2 +24.0	85.9	5 70.0 +25.0	85.9	5 74.4 +26.0	85.9	6
7	5 38.9 +14.9	84.2	5 44.9 +15.9	84.3	5 50.7 +17.0	84.4	5 56.5 +17.9	84.5	6 02.1 +19.0	84.7	6 07.7 +19.9	84.8	6 13.1 +20.9	84.9	6 18.4 +21.9	85.0	6 23.7 +22.9	85.0	6 28.0 +23.9	85.0	6 32.3 +24.9	85.0	6 36.6 +25.9	85.0	7
8	5 53.8 +14.9	83.3	6 00.8 +15.9	83.4	6 07.7 +16.8	83.5	6 14.4 +17.9	83.6	6 21.1 +18.8	83.7	6 27.6 +19.9	83.8	6 34.0 +20.9	83.9	6 40.3 +21.8	84.0	6 46.6 +22.8	84.0	6 52.9 +23.8	84.0	6 59.2 +24.8	84.0	7 65.5 +25.8	84.0	8
9	6 08.7 +14.7	82.3	6 16.7 +15.7	82.4	6 24.5 +16.8	82.5	6 32.3 +17.7	82.6	6 39.9 +18.8	82.7	6 47.5 +19.7	82.9	6 54.9 +20.7	83.0	7 02.1 +21.7	83.1	7 09.5 +22.7	83.1	7 17.1 +23.7	83.1	7 24.5 +24.7	83.1	7 31.9 +25.7	83.1	9
10	6 23.4 +14.6	81.3	6 32.4 +15.6	81.4	6 41.3 +16.6	81.5	6 50.0 +17.7	81.7	6 58.7 +18.6	81.8	7 07.2 +19.6	81.9	7 15.6 +20.6	82.0	7 23.8 +21.6	82.2	7 32.1 +22.6	82.2	7 41.4 +23.6	82.2	7 50.7 +24.6	82.2	7 59.9 +25.6	82.2	10
11	6 38.0 +14.6	80.3	6 48.0 +15.6	80.5	6 57.9 +16.5	80.6	7 07.7 +17.5	80.7	7 17.3 +18.5	80.8	7 26.8 +19.5	81.0	7 36.2 +20.5	81.1	7 45.4 +21.5	81.2	7 54.8 +22.5	81.2	8 04.2 +23.5	81.2	8 13.6 +24.5	81.2	8 23.2 +25.5	81.2	11
12	6 52.6 +14.3	79.4	7 03.6 +15.4	79.5	7 14.4 +16.4	79.6	7 25.2 +17.4	79.7	7 35.8 +18.4	79.9	7 46.3 +19.4	80.0	7 56.7 +20.3	80.1	8 06.9 +21.3	80.3	8 17.3 +22.3	80.3	8 27.7 +23.3	80.3	8 37.1 +24.3	80.3	8 46.5 +25.3	80.3	12
13	7 06.9 +14.3	78.4	7 19.0 +15.2	78.5	7 30.8 +16.3	78.6	7 42.6 +17.2	78.8	7 54.2 +18.3	78.9	8 05.7 +19.2	79.0	8 17.0 +20.2	79.2	8 28.2 +21.2	79.3	8 38.0 +22.2	79.3	8 47.8 +23.2	79.3	8 57.6 +24.2	79.3	9 6.4 +25.2	79.3	13
14	7 21.2 +14.2	77.4	7 34.2 +15.2	77.5	7 47.1 +16.1	77.7	7 59.8 +17.2	77.8	8 12.5 +18.1	77.9	8 24.9 +19.1	78.1	8 37.2 +20.1	78.2	8 49.4 +21.0	78.4	8 59.2 +22.0	78.4	9 08.0 +23.0	78.4	9 17.8 +24.0	78.4	9 27.6 +25.0	78.4	14
15	7 35.4 +14.0	76.4	7 49.4 +15.0	76.6	8 03.2 +16.0	76.7	8 17.0 +17.0	76.8	8 30.6 +17.9	77.0	8 44.0 +19.0	77.1	8 57.3 +19.9	77.3	9 10.4 +20.9	77.4	9 23.8 +21.9	77.4	9 37.2 +22.9	77.4	9 50.1 +23.9	77.4	10 03.0 +24.9	77.4	15
16	7 49.4 +13.8	75.4	8 04.4 +14.8	75.6	8 19.2 +15.9	75.7	8 34.0 +16.8	75.9	8 48.5 +17.9	76.0	9 03.0 +18.8	76.2	9 17.2 +19.8	76.3	9 31.3 +20.8	76.5	9 45.3 +21.8	76.5	9 59.1 +22.8	76.5	10 13.1 +23.8	76.5	10 27.0 +24.8	76.5	16
17	8 03.2 +13.8	74.5	8 19.2 +14.8	74.6	8 35.1 +15.7	74.7	8 50.8 +16.7	74.9	9 06.4 +17.6	75.1	9 21.8 +18.6	75.2	9 37.0 +19.6	75.4	9 52.1 +20.6	75.5	10 07.8 +21.6	75.5	10 22.6 +22.6	75.5	10 37.4 +23.6	75.5	17		
18	8 17.0 +13.6	73.5	8 34.0 +14.5	73.6	8 50.8 +15.6	73.8	9 07.5 +16.5	73.9	9 24.0 +17.5	74.1	9 40.4 +18.5	74.2	9 56.6 +19.5	74.4	10 12.7 +20.4	74.6	10 27.5 +21.4	74.6	10 42.3 +22.4	74.6	10 57.1 +23.4	74.6	18		
19	8 30.6 +13.4	72.5	8 48.5 +14.5	72.6	9 06.4 +15.4	72.8	9 24.0 +16.4	73.0	9 41.5 +17.4	73.1	9 58.9 +18.3	73.3	10 16.1 +19.2	73.4	10 33.1 +20.2	73.6	10 48.7 +21.2	73.6	10 63.5 +22.2	73.6	10 78.3 +23.2	73.6	19		
20	8 44.0 +13.3	71.5	9 03.0 +14.2	71.7	9 21.8 +15.2	71.8	9 40.4 +16.2	72.0	9 58.9 +17.2	72.1	10 17.2 +18.1	72.3	10 35.3 +19.2	72.5	10 53.3 +20.1	72.7	10 71.2 +21.1	72.7	10 89.2 +22.1	72.7	10 98.2 +23.1	72.7	20		
21	8 57.3 +13.1	70.5	9 17.2 +14.1	70.7	9 37.0 +15.1	70.8	9 56.6 +16.1	70.9	10 16.1 +17.0	71.0	10 35.3 +18.0	71.3	10 54.5 +18.9	71.5	11 13.4 +19.9	71.7	11 32.4 +20.9	71.7	11 51.4 +21.9	71.7	11 70.4 +22.9	71.7	21		
22	9 10.4 +13.0	69.5	9 31.3 +14.0	69.7	9 52.1 +14.9	69.9	10 12.7 +15.8	70.0	10 33.1 +16.8	70.2	10 53.3 +17.8	70.4	11 13.4 +18.7	70.6	11 33.3 +19.7	70.7	11 53.3 +20.7	70.7	11 73.3 +21.7	70.7	11 93.3 +22.7	70.7	22		
23	9 23.4 +12.8	68.5	9 45.3 +13.7	68.7	10 07.0 +14.7	68.9	10 28.5 +15.7	69.0	10 49.9 +16.6	69.2	11 11.1 +17.6	69.4	11 32.1 +18.6	69.6	11 53.0 +19.4	69.8	11 73.8 +20.4	69.8	11 93.8 +21.4	69.8	11 11.4 +22.4	69.8	23		
24	9 36.2 +12.6	67.6	9 59.0 +13.6	67.7	10 21.7 +14.5	67.9	10 44.2 +15.5	68.1	11 06.5 +16.5	68.2	11 28.7 +17.4	68.4	11 50.7 +18.3	68.5	11 50.7 +19.3	68.6	12 12.4 +19.3	68.8	12 32.4 +20.3	68.8	12 52.4 +21.3	68.8	12 72.4 +22.3	68.8	24
25	9 48.8 +12.5	66.6	10 12.6 +13.4	66.7	10 36.2 +14.4	66.9	10 59.7 +15.3	67.1	11 23.0 +16.2	67.3	11 46.1 +17.2	67.4	12 09.0 +18.2	67.6	12 31.7 +19.1	67.8	12 51.7 +20.1	67.8	12 71.7 +21.1	67.8	12 91.7 +22.1	67.8	25		
26	10 01.3 +12.3	65.6	10 26.0 +13.3	65.7	10 50.6 +14.2	65.9	11 15.0 +15.1	66.1	11 39.2 +16.1	66.3	12 03.3 +17.0	66.5	12 27.2 +17.9	66.7	12 50.8 +18.9	66.9	12 70.8 +19.8	67.0	12 90.8 +20.8	67.0	12 10.8 +21.8	67.0	26		
27	10 13.6 +12.1	64.6	10 39.3 +13.0	64.7	11 04.8 +14.0	64.9	11 30.1 +14.9	65.1	11 55.3 +15.8	65.3	12 20.3 +16.8	65.5	12 45.1 +17.7	65.7	13 09.7 +18.6	65.9	13 29.7 +19.5	66.0	13 49.5 +20.4	66.0	13 69.3 +21.4	66.0	27		
28	10 25.7 +11.9	63.6	10 52.3 +12.8	63.8	11 18.8 +13.7	63.9	11 45.0 +14.7	64.1	12 11.1 +15.7	64.3	12 37.1 +16.5	64.5	13 02.8 +17.5	64.7	13 28.3 +18.5	64.9	13 48.1 +19.5	65.0	13 68.1 +20.5	65.0	13 88.1 +21.5	65.0	28		
29	10 37.6 +11.7	62.6	11 05.1 +12.7	62.8	11 32.5 +13.6	62.9	11 59.7 +14.5	63.1	12 26.8 +15.4	63.3	12 53.6 +16.4	63.5	13 20.3 +17.3	63.7	13 46.8 +18.1	63.9	13 66.6 +19.1	64.0	13 86.4 +20.1	64.0	13 96.4 +21.1	64.0	29		
30	10 49.3 +11.6	61.6	11 17.8 +12.5	61.8	11 46.1 +13.4	61.9	12 14.2 +14.3	62.1	12 42.2 +15.2	62.3	13 10.0 +16.1	62.5	13 37.6 +17.0	62.7	14 04.9 +18.0	63.0	14 24.9 +19.0	63.0	14 44.7 +20.0	63.0	14 64.5 +21.0	63.0	30		
31	11 00.9 +11.3	60.6	11 30.3 +12.2	60.8	11 59.5 +13.1																				

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 86°, 274°

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.		
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z			
0	3 51.8 -15.6	91.0	3 50.7 -16.6	91.1	3 49.5 -17.6	91.2	3 48.2 -18.6	91.2	3 46.9 -19.6	91.3	3 45.5 -20.6	91.4	3 44.0 -21.5	91.4	3 42.5 -22.6	91.5	3 40.0 -23.5	91.5	3 38.0 -24.4	91.6	3 36.0 -25.3	91.6	3 34.0 -26.2	91.7	0		
1	3 36.2 -15.6	92.0	3 34.1 -16.7	92.1	3 31.9 -17.7	92.1	3 29.6 -18.6	92.2	3 27.3 -19.7	92.3	3 24.9 -20.6	92.3	3 22.5 -21.7	92.4	3 19.9 -22.6	92.4	3 17.9 -23.5	92.5	3 15.9 -24.4	92.5	3 13.9 -25.3	92.6	3 11.9 -26.2	92.7	1		
2	3 20.6 -15.8	93.0	3 17.4 -16.7	93.0	3 14.2 -17.7	93.1	3 11.0 -18.8	93.1	3 07.6 -19.7	93.2	3 04.3 -20.7	93.3	3 00.8 -21.6	93.3	2 57.3 -22.6	93.4	2 37.7 -23.5	93.4	2 17.7 -24.4	93.5	2 10.7 -25.3	93.5	2 7.7 -26.2	93.6	2		
3	3 04.8 -15.7	93.9	3 00.7 -16.8	94.0	2 56.5 -17.8	94.0	2 52.2 -18.7	94.1	2 47.9 -19.7	94.1	2 43.6 -20.8	94.2	2 39.2 -21.8	94.2	2 34.7 -22.7	94.3	2 17.4 -23.6	94.3	2 12.0 -24.5	94.4	2 10.0 -25.4	94.4	2 7.0 -26.3	94.5	3		
4	2 49.1 -15.8	94.9	2 43.9 -16.8	95.0	2 38.7 -17.8	95.0	2 33.5 -18.9	95.0	2 28.2 -19.8	95.1	2 22.8 -20.8	95.1	2 17.4 -21.7	95.2	2 12.0 -22.7	95.2	2 12.0 -23.6	95.3	2 10.0 -24.5	95.3	2 7.0 -25.4	95.4	2 4.0 -26.3	95.4	4		
5	2 33.3 -15.9	95.9	2 27.1 -16.8	96.0	2 20.9 -17.8	96.0	2 14.6 -18.8	96.0	2 08.4 -19.9	96.0	2 02.0 -20.8	96.1	1 55.7 -21.8	96.1	1 49.3 -22.8	96.1	1 49.3 -23.7	96.1	1 27.5 -24.7	96.1	1 27.5 -25.6	96.1	1 27.5 -26.5	96.1	5		
6	2 17.4 -15.9	96.8	2 10.2 -16.9	96.9	2 03.0 -17.9	96.9	1 55.8 -18.9	96.9	1 48.5 -19.8	97.0	1 41.2 -20.8	97.0	1 33.9 -21.8	97.0	1 26.5 -22.8	97.1	1 26.5 -23.7	97.1	1 03.7 -24.7	97.1	1 03.7 -25.6	97.1	1 03.7 -26.5	97.1	6		
7	2 01.5 -15.9	97.8	1 53.3 -16.9	97.8	1 45.1 -17.9	97.9	1 36.9 -18.9	97.9	1 28.7 -19.9	97.9	1 20.4 -20.9	97.9	1 12.1 -21.9	98.0	1 03.7 -22.7	98.0	1 03.7 -23.6	98.0	1 03.7 -24.5	98.0	1 03.7 -25.4	98.0	1 03.7 -26.3	98.0	7		
8	1 45.6 -16.0	98.8	1 36.4 -16.9	98.8	1 27.2 -17.9	98.8	1 18.0 -18.9	98.8	1 08.8 -19.9	98.9	0 59.5 -20.9	98.9	0 50.2 -21.8	98.9	0 41.0 -22.7	98.9	0 41.0 -23.6	98.9	0 41.0 -24.5	98.9	0 41.0 -25.4	98.9	0 41.0 -26.3	98.9	8		
9	1 29.6 -16.0	99.7	1 19.5 -17.0	99.8	1 09.3 -18.0	99.8	0 59.1 -19.0	99.8	0 48.9 -20.0	99.8	0 38.6 -20.9	99.8	0 28.4 -21.9	99.8	0 18.1 -22.8	99.8	0 18.1 -23.7	99.8	0 18.1 -24.6	99.8	0 18.1 -25.5	99.8	0 18.1 -26.4	99.8	9		
10	1 13.6 -16.0	100.7	1 02.5 -17.0	100.7	0 51.3 -18.0	100.7	0 40.1 -18.9	100.7	0 28.9 -19.9	100.8	0 17.7 -20.8	100.8	0 06.5 -21.8	100.8	0 04.7 +22.8	79.2	0 04.7 +23.7	79.2	0 04.7 +24.6	79.2	0 04.7 +25.5	79.2	0 04.7 +26.4	79.2	10		
11	0 57.6 -16.0	101.7	0 45.5 -17.0	101.7	0 33.3 -18.0	101.7	0 21.2 -19.0	101.7	0 09.0 -19.9	101.7	0 09.0 -19.9	101.7	0 03.1 +20.9	78.3	0 15.3 +21.9	78.3	0 27.5 +22.8	78.3	0 27.5 +23.7	78.3	0 27.5 +24.6	78.3	0 27.5 +25.5	78.3	11		
12	0 41.6 -16.1	102.6	0 28.5 -17.0	102.6	0 15.3 -17.9	102.6	0 02.2 -18.9	102.6	0 10.9 +19.9	77.4	0 30.8 +20.0	76.4	0 44.9 +20.9	76.4	0 59.0 +21.8	76.4	1 13.1 +22.7	76.5	1 21.3 +23.6	76.5	1 21.3 +24.5	76.5	1 21.3 +25.4	76.5	12		
13	0 25.5 -16.0	103.6	0 11.5 -17.1	103.6	0 05.6 +17.0	75.5	0 20.6 +18.0	75.5	0 35.7 +19.0	75.5	0 50.8 +19.9	75.5	1 05.8 +20.9	75.5	1 20.8 +21.8	75.5	1 35.8 +22.8	75.5	1 35.8 +23.7	75.5	1 35.8 +24.6	75.5	1 35.8 +25.5	75.5	14		
14	0 09.5 -16.0	104.5	0 05.6 +17.0	75.5	0 20.6 +18.0	75.5	0 35.7 +19.0	75.5	0 50.8 +19.9	75.5	1 05.8 +20.9	75.5	1 20.8 +21.8	75.5	1 35.8 +22.8	75.5	1 35.8 +23.7	75.5	1 35.8 +24.6	75.5	1 35.8 +25.5	75.5	14				
15	0 06.5 +16.1	74.5	0 22.6 +17.0	74.5	0 38.6 +18.0	74.5	0 54.7 +18.9	74.5	1 10.7 +19.9	74.5	1 26.7 +20.8	74.6	1 42.6 +21.8	74.6	1 58.6 +22.7	74.6	1 58.6 +23.6	74.6	1 58.6 +24.5	74.6	1 58.6 +25.4	74.6	1 58.6 +26.3	74.6	15		
16	0 22.6 +16.0	73.5	0 39.6 +17.0	73.5	0 56.6 +18.0	73.5	1 13.6 +18.9	73.6	1 30.6 +19.8	73.6	1 47.5 +20.8	73.6	2 04.4 +21.7	73.6	2 21.3 +22.7	73.7	2 21.3 +23.6	73.7	2 21.3 +24.5	73.7	2 21.3 +25.4	73.7	2 21.3 +26.3	73.7	16		
17	0 38.6 +16.1	72.6	0 56.6 +17.0	72.6	1 14.6 +17.9	72.6	1 32.5 +18.9	72.6	1 50.4 +19.8	72.6	2 08.3 +20.8	72.7	2 26.1 +21.7	72.7	2 44.0 +22.6	72.8	3 06.6 +22.6	72.8	3 06.6 +23.5	72.8	3 06.6 +24.4	72.8	3 06.6 +25.3	72.8	17		
18	0 54.7 +16.0	71.6	1 13.6 +17.0	71.6	1 32.5 +17.9	71.6	1 51.4 +18.9	71.7	2 10.2 +19.8	71.7	2 29.1 +20.7	71.8	2 47.8 +21.7	71.8	3 09.5 +22.5	70.9	3 29.2 +22.5	70.9	3 29.2 +23.4	70.9	3 29.2 +24.3	70.9	3 29.2 +25.2	70.9	19		
19	1 10.7 +16.0	70.6	1 30.6 +16.9	70.7	1 50.4 +17.9	70.7	2 10.2 +18.9	70.7	2 30.0 +19.8	70.8	2 49.8 +20.7	70.8	3 09.5 +21.6	70.8	3 11.1 +21.6	69.9	3 51.7 +22.5	70.0	3 51.7 +23.4	70.0	3 51.7 +24.3	70.0	3 51.7 +25.2	70.0	20		
20	1 26.7 +15.9	69.7	1 47.5 +16.9	69.7	2 08.3 +17.8	69.7	2 29.1 +18.7	69.8	2 49.8 +19.7	69.8	3 10.5 +20.6	69.9	3 31.1 +21.6	69.9	3 51.7 +22.5	70.0	3 51.7 +23.4	70.0	3 51.7 +24.3	70.0	3 51.7 +25.2	70.0	3 51.7 +26.1	70.0	20		
21	1 42.6 +16.0	68.7	2 04.4 +16.8	68.7	2 26.1 +17.9	68.8	2 47.8 +18.8	68.8	3 09.5 +19.7	68.9	3 31.1 +20.6	68.9	3 52.7 +21.5	69.0	4 14.2 +22.4	69.0	4 14.2 +23.3	69.0	4 14.2 +24.2	69.0	4 14.2 +25.1	69.0	4 14.2 +26.0	69.0	21		
22	1 58.6 +15.9	67.7	2 21.3 +16.8	67.8	2 44.0 +17.7	67.8	3 06.6 +18.7	67.9	3 29.2 +19.6	67.9	3 51.7 +20.5	68.0	4 14.2 +21.4	68.0	4 36.6 +22.3	68.1	4 36.6 +23.2	68.1	4 36.6 +24.1	68.1	4 36.6 +25.0	68.1	4 36.6 +25.9	68.1	22		
23	2 14.5 +15.8	66.8	2 38.1 +16.8	66.8	3 01.7 +17.7	66.9	3 25.3 +18.6	66.9	3 48.8 +19.5	67.0	4 12.2 +20.5	67.0	4 35.6 +21.3	67.1	4 58.9 +22.2	67.2	4 58.9 +23.1	67.2	4 58.9 +24.0	67.2	4 58.9 +24.9	67.2	4 58.9 +25.8	67.2	23		
24	2 30.3 +15.9	65.8	2 54.9 +16.7	65.9	3 19.4 +17.7	65.9	3 43.9 +18.6	66.0	4 08.3 +19.5	66.0	4 27.8 +19.4	66.0	4 53.0 +20.3	66.1	5 56.9 +21.2	66.2	6 21.5 +22.0	66.2	6 49.2 +21.8	66.2	6 49.2 +22.7	66.2	6 49.2 +23.6	66.2	6 49.2 +24.5	66.2	24
25	2 46.2 +15.7	64.8	3 11.6 +16.7	64.9	3 37.1 +17.6	64.9	4 02.5 +18.5	65.0	4 27.8 +19.4	65.1	4 53.0 +20.3	65.1	5 18.2 +21.2	65.2	5 43.3 +22.1	65.3	6 15.0 +22.0	65.4	6 43.3 +22.9	65.4	6 43.3 +23.8	65.4	6 43.3 +24.7	65.4	6 43.3 +25.6	65.4	25
26	3 01.9 +15.8	63.9	3 28.3 +16.7	63.9	3 54.7 +17.5	64.0	4 21.0 +18.4	64.1	4 47.2 +19.3	64.1	5 13.3 +20.2	64.2	5 39.4 +20.2	64.2	6 05.4 +20.0	64.3	6 05.4 +20.9	64.3	6 05.4 +21.8	64.3	6 05.4 +22.7	64.3	6 05.4 +23.6	64.3	26		
27	3 17.7 +15.6	62.9	3 45.0 +16.5	63.0	4 12.2 +17.5	63.0	4 39.4 +18.3	63.1	5 06.5 +19.2	63.2	5 33.5 +20.2	63.3	6 00.5 +21.0	63.3	6 27.4 +21.8	63.4	7 44.2 +21.6	63.5	8 04.8 +20.3	63.7	8 04.8 +21.2	63.7	8 04.8 +22.1	63.7	8 04.8 +23.0	63.7	27
28	3 33.3 +15.6	61.9	4 01.5 +16.5	62.0	4 29.7 +17.3	62.1	4 57.7 +18.3	62.1	5 25.7 +19.2	62.2	5 53.7 +20.0	62.3	6 21.5 +20.8	62.4	6 49.2 +20.6	62.4	7 49.2 +21.5	62.5	8 04.8 +20.3	62.7	8 04.8 +21.2	62.7	8 04.8 +22.1	62.7	8 04.8 +23.0	62.7	28
29	3 48.9 +15.6	61.0	4 18.0 +16.4	61.0	4 47.0 +17.3	61.1	5 16.0 +18.2	61.2	5 44.9 +19.0	61.3	6 13.7 +19.9	61.4	6 42.4 +20.8	61.5	7 11.0 +21.7	61.6	7 11.0 +22.6	61.6	7 11.0 +23.5	61.6	7 11.0 +24.4	61.6	7 11.0 +25.3	61.6	29		
30	4 04.5 +15.5	60.0	4 34.4 +16.4	60.1	5 04.3 +17.3	60.1	5 34.2 +18.1	60.2	6 03.9 +19.0																		

87°, 273° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180°Zn=7
L.H.A. less than 180°Zn=360°-Z

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	
0	2 53.9 +15.5	90.8	2 53.0 +16.6	90.8	2 52.1 +17.6	90.9	2 51.2 +18.5	90.9	2 50.2 +19.5	91.0	2 49.1 +20.6	91.0	2 48.0 +21.5	91.1	2 46.9 +22.5	91.1	0	2 46.9 +22.5	91.1	0	2 46.9 +22.5	91.1	0	0	
1	3 09.4 +15.5	89.8	3 09.6 +16.4	89.9	3 09.7 +17.5	89.9	3 09.7 +18.5	90.0	3 09.7 +19.5	90.0	3 09.7 +20.4	90.1	3 09.5 +21.5	90.1	3 09.4 +22.4	90.2	1	3 09.4 +22.4	90.2	1	3 09.4 +22.4	90.2	1	1	
2	3 24.9 +15.4	88.8	3 26.0 +16.5	88.9	3 27.2 +17.4	89.0	3 28.2 +18.4	89.0	3 29.2 +19.4	89.1	3 30.1 +20.4	89.1	3 31.0 +21.4	89.2	3 31.8 +22.4	89.3	2	3 31.8 +22.4	89.3	2	3 31.8 +22.4	89.3	2	2	
3	3 40.3 +15.3	87.9	3 42.5 +16.3	87.9	3 44.6 +17.3	88.0	3 46.6 +18.4	88.1	3 48.6 +19.4	88.1	3 50.5 +20.4	88.2	3 52.4 +21.3	88.3	3 54.2 +22.3	88.3	3	3 54.2 +22.3	88.3	3	3 54.2 +22.3	88.3	3	3	
4	3 55.6 +15.3	86.9	3 58.8 +16.3	87.0	4 01.9 +17.3	87.0	4 05.0 +18.3	87.1	4 08.0 +19.3	87.2	4 10.9 +20.3	87.3	4 13.7 +21.3	87.3	4 16.5 +22.2	87.4	4	4 16.5 +22.2	87.4	4	4 16.5 +22.2	87.4	4	4	
5	4 10.9 +15.2	85.9	4 15.1 +16.2	86.0	4 19.2 +17.3	86.1	4 23.3 +18.2	86.2	4 27.3 +19.2	86.2	4 31.2 +20.2	86.3	4 35.0 +21.2	86.4	4 38.7 +22.2	86.5	5	4 38.7 +22.2	86.5	5	4 38.7 +22.2	86.5	5	5	
6	4 26.1 +15.1	85.0	4 31.3 +16.2	85.0	4 36.5 +17.1	85.1	4 41.5 +18.2	85.2	4 46.5 +19.1	85.3	4 51.4 +20.1	85.4	4 56.2 +21.1	85.5	5 00.9 +22.1	85.5	6	5 00.9 +22.1	85.5	6	5 00.9 +22.1	85.5	6	6	
7	4 41.2 +15.1	84.0	4 47.5 +16.0	84.1	4 53.6 +17.1	84.2	4 59.7 +18.0	84.2	5 05.6 +19.1	84.3	5 11.5 +20.1	84.4	5 17.3 +21.0	84.5	5 23.0 +22.0	84.6	7	5 23.0 +22.0	84.6	7	5 23.0 +22.0	84.6	7	7	
8	4 56.3 +15.0	83.0	5 03.5 +16.0	83.1	5 10.7 +17.0	83.2	5 17.7 +18.0	83.3	5 24.7 +19.0	83.4	5 31.6 +19.9	83.5	5 38.3 +21.0	83.6	5 45.0 +21.9	83.7	8	5 45.0 +21.9	83.7	8	5 45.0 +21.9	83.7	8	8	
9	5 11.3 +14.8	82.1	5 19.5 +15.9	82.1	5 27.7 +16.9	82.2	5 35.7 +17.9	82.3	5 43.7 +18.9	82.4	5 51.5 +19.9	82.5	5 59.3 +20.8	82.6	6 06.9 +21.8	82.7	9	6 06.9 +21.8	82.7	9	6 06.9 +21.8	82.7	9	9	
10	5 26.1 +14.8	81.1	5 35.4 +15.8	81.2	5 44.6 +16.7	81.3	5 53.6 +17.8	81.4	6 02.6 +18.7	81.5	6 11.4 +19.8	81.6	6 20.1 +20.8	81.7	6 28.7 +21.8	81.8	10	6 28.7 +21.8	81.8	10	6 28.7 +21.8	81.8	10	10	
11	5 40.9 +14.7	80.1	5 51.2 +15.7	80.2	6 01.3 +16.7	80.3	6 11.4 +17.7	80.4	6 21.3 +18.7	80.5	6 31.2 +19.6	80.6	6 40.9 +20.6	80.7	6 50.5 +21.6	80.9	11	6 50.5 +21.6	80.9	11	6 50.5 +21.6	80.9	11	11	
12	5 55.6 +14.6	79.1	6 06.9 +15.6	79.2	6 18.0 +16.6	79.3	6 29.1 +17.5	79.5	6 40.0 +18.6	79.6	6 50.8 +19.6	79.7	7 01.5 +20.5	79.8	7 12.1 +21.4	79.9	12	7 12.1 +21.4	79.9	12	7 12.1 +21.4	79.9	12	12	
13	6 10.2 +14.5	78.2	6 22.5 +15.4	78.3	6 34.6 +16.5	78.4	6 46.6 +17.5	78.5	6 58.6 +18.4	78.6	7 10.4 +19.4	78.7	7 22.0 +20.4	78.9	7 33.5 +21.4	79.0	13	7 33.5 +21.4	79.0	13	7 33.5 +21.4	79.0	13	13	
14	6 24.7 +14.3	77.2	6 37.9 +15.4	77.3	6 51.1 +16.3	77.4	7 04.1 +17.3	77.5	7 17.0 +18.3	77.6	7 29.8 +19.3	77.8	7 42.4 +20.3	77.9	7 54.9 +21.3	78.0	14	7 54.9 +21.3	78.0	14	7 54.9 +21.3	78.0	14	14	
15	6 39.0 +14.3	76.2	6 53.3 +15.2	76.3	7 07.4 +16.3	76.4	7 21.4 +17.3	76.6	7 35.3 +18.2	76.7	7 49.1 +19.1	76.8	8 02.7 +20.1	77.0	8 16.2 +21.1	77.1	15	8 16.2 +21.1	77.1	15	8 16.2 +21.1	77.1	15	15	
16	6 53.3 +14.1	75.2	7 08.5 +15.2	75.3	7 23.7 +16.1	75.5	7 38.7 +17.0	75.6	7 53.5 +18.1	75.7	8 08.2 +19.1	75.9	8 22.8 +20.0	76.0	8 37.3 +20.9	76.1	16	8 37.3 +20.9	76.1	16	8 37.3 +20.9	76.1	16	16	
17	7 07.4 +14.0	74.2	7 23.7 +15.0	74.4	7 39.8 +15.9	74.5	7 55.7 +17.0	74.6	8 11.6 +17.9	74.8	8 27.3 +18.9	74.9	8 42.8 +19.9	75.0	8 58.2 +20.9	75.2	17	8 58.2 +20.9	75.2	17	8 58.2 +20.9	75.2	17	17	
18	7 21.4 +13.9	73.3	7 38.7 +14.8	73.4	7 55.7 +15.9	73.5	8 12.7 +16.8	73.7	8 29.5 +17.8	73.8	8 46.2 +18.7	73.9	9 02.7 +19.7	74.1	9 19.1 +20.6	74.2	18	9 19.1 +20.6	74.2	18	9 19.1 +20.6	74.2	18	18	
19	7 35.3 +13.8	72.3	7 53.5 +14.7	72.4	8 11.6 +15.7	72.5	8 29.5 +16.7	72.7	8 47.3 +17.6	72.8	9 04.9 +18.6	73.0	9 22.4 +19.6	73.1	9 39.7 +20.6	73.3	19	9 39.7 +20.6	73.3	19	9 39.7 +20.6	73.3	19	19	
20	7 49.1 +13.6	71.3	8 08.2 +14.6	71.4	8 27.3 +15.5	71.6	8 46.2 +16.5	71.7	9 04.9 +17.5	71.9	9 23.5 +18.5	72.0	9 42.0 +19.4	72.2	10 00.3 +20.3	72.3	20	10 00.3 +20.3	72.3	20	10 00.3 +20.3	72.3	20	20	
21	8 02.7 +13.5	70.3	8 22.8 +14.5	70.5	8 42.8 +15.4	70.6	9 02.7 +16.4	70.7	9 22.4 +17.3	70.9	9 42.0 +18.3	71.1	10 01.4 +19.2	71.2	10 20.6 +20.2	71.4	21	10 20.6 +20.2	71.4	21	10 20.6 +20.2	71.4	21	21	
22	8 16.2 +13.3	69.3	8 37.3 +14.3	69.5	8 58.2 +15.3	69.6	9 19.1 +16.2	69.8	9 39.7 +17.2	69.9	10 00.3 +18.1	70.1	10 20.6 +19.1	70.3	10 40.8 +20.0	70.4	22	10 40.8 +20.0	70.4	22	10 40.8 +20.0	70.4	22	22	
23	8 29.5 +13.2	68.3	8 51.6 +14.1	68.5	9 13.5 +15.1	68.6	9 35.3 +16.0	68.8	9 56.9 +17.0	69.0	10 18.4 +17.9	69.1	10 39.7 +18.9	69.3	11 00.8 +19.8	69.5	23	11 00.8 +19.8	69.5	23	11 00.8 +19.8	69.5	23	23	
24	8 42.7 +13.0	67.4	9 05.7 +14.0	67.5	9 28.6 +14.9	67.7	9 51.3 +15.9	67.8	10 13.9 +16.8	68.0	10 36.3 +17.8	68.1	10 58.6 +18.7	68.3	11 20.6 +19.7	68.5	24	11 20.6 +19.7	68.5	24	11 20.6 +19.7	68.5	24	24	
25	8 55.7 +12.9	66.4	9 19.7 +13.8	66.5	9 43.5 +14.6	66.7	10 07.2 +15.7	66.8	10 30.7 +16.7	67.0	10 54.1 +17.5	67.2	11 17.3 +18.5	67.4	11 40.3 +19.4	67.5	25	11 40.3 +19.4	67.5	25	11 40.3 +19.4	67.5	25	25	
26	9 08.6 +12.7	65.4	9 33.5 +13.6	65.5	9 58.3 +14.6	65.7	10 22.9 +15.5	65.9	10 47.4 +16.4	66.0	11 11.6 +17.4	66.2	11 35.8 +18.3	66.4	11 59.7 +19.3	66.6	26	11 59.7 +19.3	66.6	26	11 59.7 +19.3	66.6	26	26	
27	9 21.3 +12.5	64.4	9 47.1 +13.5	64.5	10 12.9 +14.4	64.7	10 38.4 +15.3	64.9	11 03.8 +16.3	65.0	11 29.0 +17.2	65.2	11 54.1 +18.1	65.4	12 19.0 +19.0	65.6	27	12 19.0 +19.0	65.6	27	12 19.0 +19.0	65.6	27	27	
28	9 33.8 +12.4	63.4	10 00.6 +13.3	63.6	10 27.3 +14.2	63.7	10 53.7 +15.2	63.9	11 20.1 +16.0	64.1	11 46.2 +17.0	64.2	12 12.2 +17.9	64.4	12 38.0 +18.8	64.6	28	12 38.0 +18.8	64.6	28	12 38.0 +18.8	64.6	28	28	
29	9 46.2 +12.2	62.4	10 13.9 +13.1	62.6	10 41.5 +14.0	62.7	11 08.9 +14.9	62.9	11 36.1 +15.9	63.1	12 03.2 +16.8	63.3	12 30.1 +17.7	63.5	12 56.8 +18.6	63.7	29	12 56.8 +18.6	63.7	29	12 56.8 +18.6	63.7	29	29	
30	9 58.4 +12.0	61.4	10 27.0 +13.0	61.6	10 55.5 +13.9	61.7	11 23.8 +14.8	61.9	11 52.0 +15.7	62.1	12 20.0 +16.6	62.3	12 47.8 +17.5	62.5	13 15.4 +18.4	62.7	30	13 15.4 +18.4	62.7	30	13 15.4 +18.4	62.7	30	30	
31	10 10.4 +11.8	60.4	10 40.0 +12.7	60.6	11 09.4 +13.6	60.7	11 38.6 +14.6	60.9	12 07.7 +15.4	61.1	12 36.6 +16.3	61.3	13 05.3 +17.3	61.5	13 33.8 +18.2	61.7	31	13 33.8 +18.2	61.7	31	13 33.8 +18.2	61.7	31	31	
32	10 22.3 +11.6	59.4	10 52.7 +12.6	59.6	11 23.0 +13.5	59.8	11 53.2 +14.3	59.9	12 23.1 +15.3	60.1	12 52.9 +16.2	60.3	13 22.6 +17.0	60.5	13 52.0 +17.9	60.7	32	13 52.0 +17.9	60.7	32	13 52.0 +17.9	60.7	32	32	
33	10 33.9 +11.5	58.4	11 05.3 +12.3	58.6	11 36.5 +13.2	58.8	12 07.5 +14.1	58.9																	

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 87°, 273°

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	
0	2 53.9	-15.6	90.8	2 53.0	-16.6	90.8	2 52.1	-17.6	90.9	2 51.2	-18.6	90.9	2 50.2	-19.6	91.0	2 49.1	-20.5	91.0	2 48.0	-21.5	91.1	2 46.9	-22.5	91.1	0
1	2 38.3	-15.6	91.7	2 36.4	-16.6	91.8	2 34.5	-17.6	91.8	2 32.6	-18.6	91.9	2 30.6	-19.6	91.9	2 28.6	-20.6	92.0	2 26.5	-21.6	92.0	2 24.4	-22.6	92.1	1
2	2 22.7	-15.7	92.7	2 19.8	-16.7	92.8	2 16.9	-17.7	92.8	2 14.0	-18.7	92.8	2 11.0	-19.7	92.9	2 08.0	-20.7	92.9	2 04.9	-21.6	92.9	2 01.8	-22.6	93.0	2
3	2 07.0	-15.7	93.7	2 03.1	-16.7	93.7	1 59.2	-17.7	93.7	1 55.3	-18.7	93.8	1 51.3	-19.7	93.8	1 47.3	-20.7	93.8	1 43.3	-21.7	93.9	1 39.2	-22.6	93.9	3
4	1 51.3	-15.7	94.6	1 46.4	-16.7	94.7	1 41.5	-17.7	94.7	1 36.6	-18.7	94.7	1 31.6	-19.7	94.8	1 26.6	-20.6	94.8	1 21.6	-21.6	94.8	1 16.6	-22.7	94.8	4
5	1 35.6	-15.8	95.6	1 29.7	-16.7	95.6	1 23.8	-17.7	95.7	1 17.9	-18.6	95.7	1 11.9	-19.7	95.7	1 06.0	-20.8	95.7	1 00.0	-21.7	95.7	0 53.9	-22.6	95.8	5
6	1 19.8	-15.7	96.6	1 13.0	-16.8	96.6	1 06.1	-17.8	96.6	0 59.1	-18.7	96.6	0 52.2	-19.8	96.6	0 45.2	-20.7	96.7	0 38.3	-21.7	96.7	0 31.3	-22.7	96.7	6
7	1 04.1	-15.8	97.5	0 56.2	-16.8	97.6	0 48.3	-17.8	97.6	0 40.4	-18.8	97.6	0 32.4	-19.7	97.6	0 24.5	-20.7	97.6	0 16.6	-21.7	97.6	0 08.6	-22.6	97.6	7
8	0 48.3	-15.8	98.5	0 39.4	-16.8	98.5	0 30.5	-17.8	98.5	0 21.6	-18.8	98.5	0 12.7	-19.8	98.5	0 03.8	-20.7	98.5	0 05.1	+21.7	81.5	0 14.0	+22.7	81.5	8
9	0 32.5	-15.9	99.5	0 22.6	-16.8	99.5	0 12.7	-17.8	99.5	0 02.8	-18.8	99.5	0 07.1	+19.7	80.5	0 16.9	+20.8	80.5	0 26.8	+21.7	80.5	0 36.7	+22.6	80.5	9
10	0 16.6	-15.8	100.4	0 05.8	-16.8	100.4	0 05.1	+17.8	79.6	0 16.0	+18.7	79.6	0 26.8	+19.8	79.6	0 37.7	+20.7	79.6	0 48.5	+21.7	79.6	0 59.3	+22.7	79.6	10
11	0 00.8	-15.8	101.4	0 11.0	+16.8	78.6	0 22.9	+17.8	78.6	0 34.7	+18.8	78.6	0 46.6	+19.7	78.6	0 58.4	+20.7	78.6	1 10.2	+21.7	78.7	1 22.0	+22.6	78.7	11
12	0 15.0	+15.8	77.6	0 27.8	+16.8	77.6	0 40.7	+17.8	77.7	0 53.5	+18.7	77.7	1 06.3	+19.7	77.7	1 19.1	+20.7	77.7	1 31.9	+21.6	77.7	1 44.6	+22.6	77.8	12
13	0 30.8	+15.8	76.7	0 44.6	+16.8	76.7	0 58.5	+17.7	76.7	1 12.2	+18.8	76.7	1 26.0	+19.7	76.7	1 39.8	+20.6	76.8	1 53.5	+21.6	76.8	2 07.2	+22.5	76.8	13
14	0 46.6	+15.8	75.7	1 01.4	+16.8	75.7	1 16.2	+17.8	75.7	1 31.0	+18.7	75.8	1 45.7	+19.7	75.8	2 00.4	+20.6	75.8	2 15.1	+21.6	75.9	2 29.7	+22.5	75.9	14
15	1 02.4	+15.8	74.7	1 18.2	+16.7	74.8	1 34.0	+17.7	74.8	1 49.7	+18.7	74.8	2 05.4	+19.6	74.8	2 21.0	+20.6	74.9	2 36.7	+21.5	74.9	2 52.2	+22.5	75.0	15
16	1 18.2	+15.8	73.8	1 34.9	+16.8	73.8	1 51.7	+17.7	73.8	2 08.4	+18.6	73.9	2 25.0	+19.6	73.9	2 41.6	+20.6	73.9	2 58.2	+21.5	74.0	3 14.7	+22.4	74.0	16
17	1 34.0	+15.7	72.8	1 51.7	+16.7	72.8	2 09.4	+17.6	72.9	2 27.0	+18.6	72.9	2 44.6	+19.6	73.0	3 02.2	+20.5	73.0	3 19.7	+21.4	73.1	3 37.1	+22.4	73.1	17
18	1 49.7	+15.7	71.8	2 08.4	+16.6	71.9	2 27.0	+17.6	71.9	2 45.6	+18.6	72.0	3 04.2	+19.5	72.0	3 22.7	+20.4	72.1	3 41.1	+21.4	72.1	3 59.5	+22.3	72.2	18
19	2 05.4	+15.6	70.9	2 25.0	+16.6	70.9	2 44.6	+17.6	71.0	3 04.2	+18.5	71.0	3 23.7	+19.4	71.1	3 43.1	+20.4	71.1	4 02.5	+21.3	71.2	4 21.8	+22.2	71.3	19
20	2 21.0	+15.7	69.9	2 41.6	+16.6	70.0	3 02.2	+17.5	70.0	3 22.7	+18.4	70.1	3 43.1	+19.4	70.1	4 03.5	+20.3	70.2	4 23.8	+21.2	70.2	4 44.0	+22.2	70.3	20
21	2 36.7	+15.5	69.0	2 58.2	+16.5	69.0	3 19.7	+17.4	69.0	3 41.1	+18.4	69.1	4 02.5	+19.3	69.2	4 23.8	+20.2	69.2	4 45.0	+21.2	69.3	5 06.2	+22.0	69.4	21
22	2 52.2	+15.6	68.0	3 14.7	+16.5	68.0	3 37.1	+17.4	68.1	3 59.5	+18.3	68.2	4 18.8	+19.2	68.2	4 44.0	+20.2	68.3	5 06.2	+21.1	68.4	5 28.2	+22.0	68.5	22
23	3 07.8	+15.5	67.0	3 31.2	+16.4	67.1	3 54.5	+17.4	67.1	4 17.8	+18.3	67.2	4 41.0	+19.2	67.3	5 04.2	+20.1	67.3	5 27.3	+20.9	67.4	5 50.2	+21.9	67.5	23
24	3 23.3	+15.4	66.0	3 47.6	+16.3	66.1	4 11.9	+17.2	66.2	4 36.1	+18.1	66.2	5 00.2	+19.1	66.3	5 24.3	+20.0	66.4	5 48.2	+20.9	66.5	6 12.1	+21.8	66.6	24
25	3 38.7	+15.3	65.1	4 03.9	+16.3	65.1	4 29.1	+17.2	65.2	4 54.2	+18.1	65.3	5 19.3	+19.0	65.4	5 44.3	+19.9	65.5	6 09.1	+20.8	65.5	6 33.9	+21.7	65.6	25
26	3 54.0	+15.3	64.1	4 20.2	+16.2	64.2	4 46.3	+17.1	64.2	5 12.3	+18.0	64.3	5 38.3	+18.9	64.4	6 04.2	+19.7	64.5	6 29.9	+20.7	64.6	6 55.6	+21.6	64.7	26
27	4 09.3	+15.2	63.1	4 36.4	+16.1	63.2	5 03.4	+17.0	63.3	5 30.3	+17.9	63.4	5 57.2	+18.8	63.5	6 23.9	+19.7	63.6	6 50.6	+20.6	63.7	7 17.2	+21.5	63.8	27
28	4 24.5	+15.2	62.2	4 52.5	+16.0	62.2	5 20.4	+16.9	62.3	5 48.2	+17.9	62.4	6 16.0	+18.7	62.5	6 43.6	+19.6	62.6	7 11.2	+20.5	62.7	7 38.7	+21.3	62.8	28
29	4 39.7	+15.0	61.2	5 08.5	+16.0	61.3	5 37.3	+16.9	61.4	6 06.1	+17.7	61.4	6 34.7	+18.6	61.5	7 03.2	+19.5	61.7	7 31.7	+20.3	61.8	8 00.0	+21.2	61.9	29
30	4 54.7	+15.0	60.2	5 24.5	+15.8	60.3	5 54.2	+16.7	60.4	6 23.8	+17.6	60.5	6 53.3	+18.5	60.6	7 22.7	+19.3	60.7	7 52.0	+20.2	60.8	8 21.2	+21.1	60.9	30
31	5 09.7	+14.9	59.3	5 40.3	+15.8	59.3	6 10.9	+16.6	59.4	6 41.4	+17.5	59.5	7 11.8	+18.3	59.6	7 42.0	+19.3	59.7	8 12.2	+20.1	59.9	8 42.3	+20.9	60.0	31
32	5 24.6	+14.8	58.3	5 56.1	+15.7	58.4	6 27.5	+16.5	58.5	6 58.9	+17.3	58.6	7 30.1	+18.2	58.7	8 01.3	+19.0	58.8	8 32.3	+19.9	58.9	9 03.2	+20.8	59.0	32
33	5 39.4	+14.7	57.3	6 11.8	+15.5	57.4	6 44.0	+16.5	57.5	7 16.2	+17.3	57.6	7 48.3	+18.1	57.7	8 20.3	+19.0	57.8	8 52.2	+19.8	58.0	9 24.0	+20.6	58.1	33
34	5 54.1	+14.6	56.3	6 27.3	+15.5	56.4	7 00.5	+16.2	56.5	7 33.5	+17.1	56.6	8 06.4	+18.0	56.7	9 12.0	+19.7	57.0	9 44.6	+20.5	57.1	9 54.6	+21.4	57.2	34
35	6 08.7	+14.5	55.4	6 42.8	+15.3	55.5	7 16.7	+16.2	55.6	8 24.4	+17.8	55.7	8 42.2	+17.7	55.8	9 58.1	+18.7	55.9	9 31.7	+19.5	56.0	10 05.1	+20.3	56.2	35
36	6 23.2	+14.4	54.4	6 58.1	+15.2	54.5	7 32.9	+16.0	54.6	8 07.6	+16.9	54.7	8 42.2	+17.7	54.8	9 16.8	+18.5	54.9	9 51.2	+19.3	55.1	10 25.4	+20.2	55.2	36
37	6 37.6	+14.2	53.4	7 13.8	+15.1	53.5	7 48.9	+15.9	53.6	8 24.5	+16.7	53.7	8 59.9	+17.5	53.9	9 35.3	+18.3	54.0	10 10.5	+19.1	54.1	10 45.6	+19.9	54.3	37
38	6 51.8	+14.2	52.4	7 28.4	+14.9	52.5	8 04.8	+15.8	52.6	8 41.2	+16.6	52.8	9 17.4	+17.4	52.9	9 53.6	+18.2	53.0	10 29.6	+19.0	53.2	11 05.5	+19.8	53.3	38
39	7																								

88°, 272° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180°Zn=7
L.H.A. less than 180°Zn=360°-Z

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	
0	1 55.9 +15.5	90.5	1 55.3 +16.6	90.6	1 54.8 +17.5	90.6	1 54.1 +18.6	90.6	1 53.5 +19.5	90.7	1 52.8 +20.5	90.7	1 52.0 +21.5	90.7	1 51.3 +22.4	90.7	0	1 51.3 +22.4	90.7	0	1 51.3 +22.4	90.7	0	0	
1	2 11.4 +15.5	89.6	2 11.9 +16.5	89.6	2 12.3 +17.5	89.6	2 12.7 +18.5	89.7	2 13.0 +19.5	89.7	2 13.3 +20.5	89.7	2 13.5 +21.5	89.8	2 13.7 +22.5	89.8	1	2 13.7 +22.5	89.8	1	2 13.7 +22.5	89.8	1	0	
2	2 26.9 +15.5	88.6	2 28.4 +16.4	88.6	2 29.8 +17.4	88.7	2 31.2 +18.4	88.7	2 32.5 +19.4	88.8	2 33.8 +20.4	88.8	2 35.0 +21.4	88.8	2 36.2 +22.4	88.9	2	2 36.2 +22.4	88.9	2	2 36.2 +22.4	88.9	2	0	
3	2 42.4 +15.4	87.6	2 44.8 +16.4	87.7	2 47.2 +17.5	87.7	2 49.6 +18.4	87.8	2 51.9 +19.4	87.8	2 54.2 +20.4	87.9	2 56.4 +21.4	87.9	2 58.6 +22.3	88.0	3	2 58.6 +22.3	88.0	3	2 58.6 +22.3	88.0	3	0	
4	2 57.8 +15.3	86.6	3 01.2 +16.4	86.7	3 04.7 +17.3	86.8	3 08.0 +18.4	86.8	3 11.3 +19.4	86.9	3 14.6 +20.3	86.9	3 17.8 +21.3	87.0	3 20.9 +22.3	87.0	4	3 20.9 +22.3	87.0	4	3 20.9 +22.3	87.0	4	0	
5	3 13.1 +15.3	85.7	3 17.6 +16.3	85.7	3 22.0 +17.3	85.8	3 26.4 +18.3	85.9	3 30.7 +19.3	85.9	3 34.9 +20.3	86.0	3 39.1 +21.3	86.0	3 43.2 +22.3	86.1	5	3 43.2 +22.3	86.1	5	3 43.2 +22.3	86.1	5	0	
6	3 28.4 +15.2	84.7	3 33.9 +16.2	84.8	3 39.3 +17.3	84.8	3 44.7 +18.2	84.9	3 50.0 +19.2	85.0	3 55.2 +20.2	85.0	4 00.4 +21.2	85.1	4 05.5 +22.1	85.2	6	4 05.5 +22.1	85.2	6	4 05.5 +22.1	85.2	6	0	
7	3 43.6 +15.2	83.7	3 50.1 +16.2	83.8	3 56.6 +17.1	83.9	4 02.9 +18.2	83.9	4 09.2 +19.2	84.0	4 15.4 +20.2	84.1	4 21.6 +21.1	84.2	4 27.6 +22.1	84.2	7	4 27.6 +22.1	84.2	7	4 27.6 +22.1	84.2	7	0	
8	3 58.8 +15.1	82.8	4 06.3 +16.1	82.8	4 13.7 +17.1	82.9	4 21.1 +18.1	83.0	4 28.4 +19.1	83.1	4 35.6 +20.0	83.1	4 42.7 +21.0	83.2	4 49.7 +22.1	83.3	8	4 49.7 +22.1	83.3	8	4 49.7 +22.1	83.3	8	0	
9	4 13.9 +15.0	81.8	4 22.4 +16.0	81.9	4 30.8 +17.1	82.0	4 39.2 +18.0	82.0	4 47.5 +19.0	82.1	4 55.6 +20.0	82.2	5 03.7 +21.0	82.3	5 11.8 +21.9	82.4	9	5 11.8 +21.9	82.4	9	5 11.8 +21.9	82.4	9	0	
10	4 28.9 +15.0	80.8	4 38.4 +16.0	80.9	4 47.9 +16.9	81.0	4 57.2 +17.9	81.1	5 06.5 +18.9	81.2	5 15.6 +20.0	81.3	5 24.7 +20.9	81.3	5 33.7 +21.9	81.4	10	5 33.7 +21.9	81.4	10	5 33.7 +21.9	81.4	10	0	
11	4 43.9 +14.8	79.9	4 54.4 +15.8	79.9	5 04.8 +16.9	80.0	5 15.1 +17.9	80.1	5 25.4 +18.8	80.2	5 35.6 +19.8	80.3	5 45.6 +20.8	80.4	5 55.6 +21.7	80.5	11	5 55.6 +21.7	80.5	11	5 55.6 +21.7	80.5	11	0	
12	4 58.7 +14.8	78.9	5 10.2 +15.8	79.0	5 21.7 +16.7	79.1	5 33.0 +17.8	79.2	5 44.2 +18.8	79.3	5 55.4 +19.7	79.4	6 06.4 +20.7	79.5	6 17.3 +21.7	79.6	12	6 17.3 +21.7	79.6	12	6 17.3 +21.7	79.6	12	0	
13	5 13.5 +14.7	77.9	5 26.0 +15.7	78.0	5 38.4 +16.7	78.1	5 50.8 +17.6	78.2	6 03.0 +18.6	78.3	6 15.1 +19.6	78.4	6 27.1 +20.6	78.5	6 39.0 +21.5	78.6	13	6 39.0 +21.5	78.6	13	6 39.0 +21.5	78.6	13	0	
14	5 28.2 +14.6	76.9	5 41.7 +15.6	77.0	5 55.1 +16.6	77.1	6 08.4 +17.6	77.2	6 21.6 +18.6	77.3	6 34.7 +19.5	77.5	6 47.7 +20.5	77.6	7 00.5 +21.5	77.7	14	7 00.5 +21.5	77.7	14	7 00.5 +21.5	77.7	14	0	
15	5 42.8 +14.5	76.0	5 57.3 +15.5	76.1	6 11.7 +16.5	76.2	6 26.0 +17.4	76.3	6 40.2 +18.4	76.4	6 54.2 +19.4	76.5	7 08.2 +20.3	76.6	7 22.0 +21.3	76.7	15	7 22.0 +21.3	76.7	15	7 22.0 +21.3	76.7	15	0	
16	5 57.3 +14.4	75.0	6 12.8 +15.4	75.1	6 28.2 +16.3	75.2	6 43.4 +17.4	75.3	6 58.6 +18.3	75.4	7 13.6 +19.3	75.6	7 28.5 +20.3	75.7	7 43.3 +21.2	75.8	16	7 43.3 +21.2	75.8	16	7 43.3 +21.2	75.8	16	0	
17	6 11.7 +14.3	74.0	6 28.2 +15.2	74.1	6 44.5 +16.3	74.2	7 00.8 +17.2	74.3	7 16.9 +18.2	74.5	7 32.9 +19.1	74.6	7 48.8 +20.1	74.7	8 04.5 +21.1	74.9	17	8 04.5 +21.1	74.9	17	8 04.5 +21.1	74.9	17	0	
18	6 26.0 +14.2	73.0	6 43.4 +15.2	73.1	7 00.8 +16.1	73.2	7 18.0 +17.1	73.4	7 35.1 +18.0	73.5	7 52.0 +19.1	73.6	8 08.9 +20.0	73.8	8 25.6 +20.9	73.9	18	8 25.6 +20.9	73.9	18	8 25.6 +20.9	73.9	18	0	
19	6 40.2 +14.0	72.1	6 58.6 +15.0	72.2	7 16.9 +16.0	72.3	7 35.1 +16.9	72.4	7 53.1 +18.0	72.5	8 11.1 +18.8	72.7	8 28.9 +19.8	72.8	8 46.5 +20.8	73.0	19	8 46.5 +20.8	73.0	19	8 46.5 +20.8	73.0	19	0	
20	6 54.2 +14.0	71.1	7 13.6 +14.9	71.2	7 32.9 +15.9	71.3	7 52.0 +16.9	71.4	8 11.1 +17.8	71.6	8 29.9 +18.8	71.7	8 48.7 +19.7	71.9	9 07.3 +20.6	72.0	20	9 07.3 +20.6	72.0	20	9 07.3 +20.6	72.0	20	0	
21	7 08.2 +13.8	70.1	7 28.5 +14.8	70.2	7 48.8 +15.7	70.3	8 08.9 +16.7	70.5	8 28.9 +17.6	70.6	8 48.7 +18.6	70.8	9 08.4 +19.5	70.9	9 27.9 +20.5	71.1	21	9 27.9 +20.5	71.1	21	9 27.9 +20.5	71.1	21	0	
22	7 22.0 +13.7	69.1	7 43.3 +14.6	69.2	8 04.5 +15.6	69.4	8 25.6 +16.5	69.5	8 46.5 +17.5	69.7	9 07.3 +18.4	69.8	9 27.9 +19.4	70.0	9 48.4 +20.4	70.1	22	9 48.4 +20.4	70.1	22	9 48.4 +20.4	70.1	22	0	
23	7 35.7 +13.5	68.1	7 57.9 +14.6	68.3	8 20.1 +15.5	68.4	8 42.1 +16.4	68.5	9 04.0 +17.4	68.7	9 25.7 +18.3	68.8	9 47.3 +19.3	69.0	10 08.8 +20.1	69.2	23	10 08.8 +20.1	69.2	23	10 08.8 +20.1	69.2	23	0	
24	7 49.2 +13.4	67.2	8 12.5 +14.3	67.3	8 35.6 +15.3	67.4	8 58.5 +16.3	67.6	9 21.4 +17.1	67.7	9 44.0 +18.2	67.9	10 06.6 +19.0	68.0	10 28.9 +20.0	68.2	24	10 28.9 +20.0	68.2	24	10 28.9 +20.0	68.2	24	0	
25	8 02.6 +13.3	66.2	8 26.8 +14.2	66.3	8 50.9 +15.1	66.4	9 14.8 +16.1	66.6	9 38.5 +17.1	66.7	10 02.2 +17.9	66.9	10 25.6 +18.9	67.1	10 48.9 +19.8	67.2	25	10 48.9 +19.8	67.2	25	10 48.9 +19.8	67.2	25	0	
26	8 15.9 +13.2	65.2	8 41.0 +14.1	65.3	9 06.0 +15.0	65.5	9 30.9 +15.9	65.6	9 55.6 +16.6	65.8	10 20.1 +17.6	65.9	10 44.5 +18.7	66.1	11 08.7 +19.7	66.3	26	11 08.7 +19.7	66.3	26	11 08.7 +19.7	66.3	26	0	
27	8 29.1 +12.9	64.2	8 55.1 +13.9	64.3	9 21.0 +14.9	64.5	9 46.8 +15.8	64.6	10 12.4 +16.7	64.8	10 37.9 +17.6	65.0	11 03.2 +18.5	65.1	11 28.4 +19.4	65.3	27	11 28.4 +19.4	65.3	27	11 28.4 +19.4	65.3	27	0	
28	8 42.0 +12.9	63.2	9 09.0 +13.8	63.4	9 35.9 +14.6	63.5	10 02.6 +15.5	63.7	10 29.1 +16.5	63.8	10 55.5 +17.4	64.0	11 21.7 +18.4	64.3	11 47.8 +19.2	64.3	28	11 47.8 +19.2	64.3	28	11 47.8 +19.2	64.3	28	0	
29	8 54.9 +12.7	62.2	9 22.8 +13.6	62.4	9 50.5 +14.5	62.5	10 18.1 +15.5	62.7	10 45.6 +16.3	62.8	11 12.9 +17.3	63.0	11 40.1 +18.1	63.2	12 07.0 +19.1	63.4	29	12 07.0 +19.1	63.4	29	12 07.0 +19.1	63.4	29	0	
30	9 07.6 +12.5	61.2	9 36.4 +13.4	61.4	10 05.0 +14.4	61.5	10 33.6 +15.2	61.7	11 01.9 +16.2	61.9	11 30.2 +17.0	62.0	11 58.2 +17.9	62.2	12 26.1 +18.8	62.4	30	12 26.1 +18.8	62.4	30	12 26.1 +18.8	62.4	30	0	
31	9 20.1 +12.3	60.2	9 49.8 +13.2	60.4	10 19.4 +14.1	60.5	10 48.8 +15.0	60.7	11 18.1 +15.9	60.9	11 47.2 +16.8	61.1	12 16.1 +17.8	61.2	12 44.9 +18.6	61.4	31	12 44.9 +18.6	61.4	31	12 44.9 +18.6	61.4	31	0	
32	9 32.4 +12.2	59.3	10 03.0 +13.1	59.4	10 33.5 +14.0	59.6	11 03.8 +14.9	59.7	11 34.0 +15.7	59.9	12 04.0 +16.6	60.1	12 33.9 +17.5	60.3	13 03.5 +18.4	60.5	32	13 03.5 +18.4	60.5	32	13 03.5 +18.4	60.5	32	0	
33	9 44.6 +12.0	58.3	10 16.1 +12.9	58.4	10 47.5 +13.7	58.6	11 18.7 +14.6	58.7	11 49.7 +15.6	58.9	12 20.6 +16.5	59.1	1												

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 88°, 272°

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	
0	1 55.9 -15.5	90.5	1 55.3 -16.5	90.6	1 54.8 -17.6	90.6	1 54.1 -18.5	90.6	1 53.5 -19.6	90.7	1 52.8 -20.6	90.7	1 52.0 -21.5	90.7	1 51.3 -22.5	90.7	0 01.4 +22.6	84.6	5	0	1 28.8 -22.6	91.7	1		
1	1 40.4 -15.6	91.5	1 38.8 -16.6	91.5	1 37.2 -17.6	91.5	1 35.6 -18.6	91.6	1 33.9 -19.6	91.6	1 32.2 -20.6	91.6	1 30.5 -21.6	91.7	1 28.8 -22.6	91.7	0 24.0 +22.5	83.7	6	1	1 06.2 -22.5	92.6	2		
2	1 24.8 -15.6	92.5	1 22.2 -16.6	92.5	1 19.6 -17.6	92.5	1 17.0 -18.6	92.5	1 14.3 -19.6	92.5	1 11.6 -20.5	92.6	1 08.9 -21.5	92.6	0 43.7 -22.6	93.5	3	0 21.1 -22.5	94.5	4	0	1 09.1 +22.5	81.8	8	
3	1 09.2 -15.7	93.4	1 05.6 -16.7	93.4	1 02.0 -17.7	93.5	0 58.4 -18.7	93.5	0 54.7 -19.6	93.5	0 51.1 -20.7	93.5	0 47.4 -21.6	93.5	0 25.8 -21.6	94.5	0 01.4 +22.6	84.6	5	0	1 21.1 -22.5	94.5	4		
4	0 53.5 -15.6	94.4	0 48.9 -16.6	94.4	0 44.3 -17.6	94.4	0 39.7 -18.6	94.4	0 35.1 -19.6	94.4	0 30.4 -20.6	94.4	0 25.8 -21.6	94.5	0 04.2 -21.6	95.4	0 04.2 +22.6	84.6	5	0	1 51.3 -22.5	90.7	0		
5	0 37.9 -15.7	95.3	0 32.3 -16.7	95.4	0 26.7 -17.7	95.4	0 21.1 -18.7	95.4	0 15.5 -19.7	95.4	0 09.8 -20.6	95.4	0 04.2 -21.6	95.4	0 04.2 +22.6	84.6	5	0	1 28.8 -22.6	91.7	1				
6	0 22.2 -15.6	96.3	0 15.6 -16.6	96.3	0 09.0 -17.6	96.3	0 02.4 -18.6	96.3	0 04.2 +19.6	83.7	0 10.8 +20.6	83.7	0 17.4 +21.6	83.7	0 24.0 +22.5	83.7	6	0	1 46.5 +22.6	82.8	7				
7	0 06.6 -15.7	97.3	0 01.0 +16.7	82.7	0 08.6 +17.7	82.7	0 16.2 +18.7	82.7	0 23.8 +19.6	82.7	0 31.4 +20.6	82.7	0 39.0 +21.5	82.8	1 09.1 +22.5	81.8	8	1	1 22.1 +21.5	80.9	9				
8	0 09.1 +15.6	81.8	0 17.7 +16.6	81.8	0 26.3 +17.6	81.8	0 34.9 +18.6	81.8	0 43.4 +19.6	81.8	0 52.0 +20.6	81.8	1 00.5 +21.6	81.8	1 54.1 +22.5	80.0	10	1	2 16.6 +22.4	79.1	11				
9	0 24.7 +15.7	80.8	0 34.3 +16.7	80.8	0 43.9 +17.6	80.8	0 53.5 +18.6	80.8	1 03.0 +19.6	80.8	1 12.6 +20.6	80.9	1 21.1 +21.5	80.9	1 31.6 +22.5	80.9	9	1	2 26.6 +21.5	78.1	12				
10	0 40.4 +15.6	79.8	0 51.0 +16.6	79.8	1 01.5 +17.7	79.9	1 12.1 +18.6	79.9	1 22.6 +19.6	79.9	1 33.2 +20.5	79.9	1 43.6 +21.6	79.9	1 54.1 +22.5	80.0	10	1	2 39.0 +22.4	78.1	13				
11	0 56.0 +15.6	78.9	1 07.6 +16.6	78.9	1 19.2 +17.6	78.9	1 30.7 +18.6	78.9	1 42.2 +19.6	79.0	1 53.7 +20.5	79.0	2 05.2 +21.4	79.0	2 16.6 +22.4	79.1	11	1	2 49.0 +22.4	78.1	14				
12	1 11.6 +15.6	77.9	1 24.2 +16.6	77.9	1 36.8 +17.5	77.9	1 49.3 +18.5	78.0	2 01.8 +19.5	78.0	2 14.2 +20.5	78.0	2 26.6 +21.5	78.1	3 01.4 +22.3	77.2	13	1	2 39.0 +22.4	78.1	12				
13	1 27.2 +15.6	76.9	1 40.8 +16.6	77.0	1 54.3 +17.6	77.0	2 07.8 +18.5	77.0	2 21.3 +19.5	77.1	2 34.7 +20.4	77.1	2 48.1 +21.4	77.1	3 09.5 +21.3	76.2	13	1	2 37.7 +22.3	76.3	14				
14	1 42.8 +15.6	76.0	1 57.4 +16.5	76.0	2 11.9 +17.5	76.0	2 26.3 +18.5	76.1	2 40.8 +19.4	76.1	2 55.1 +20.4	76.2	3 09.5 +21.3	76.2	3 23.7 +22.3	76.3	14	1	2 45.7 +22.0	75.5	15				
15	1 58.4 +15.5	75.0	2 13.9 +16.5	75.0	2 29.4 +17.4	75.1	2 44.8 +18.4	75.1	3 00.2 +19.4	75.2	3 15.5 +20.4	75.2	3 30.8 +21.3	75.3	3 46.0 +22.3	75.3	15	1	2 46.0 +22.3	75.3	16				
16	2 13.9 +15.5	74.0	2 30.4 +16.4	74.1	2 46.8 +17.4	74.1	3 03.2 +18.4	74.2	3 19.6 +19.3	74.2	3 35.9 +20.2	74.3	3 52.1 +21.2	74.3	4 08.3 +22.1	74.4	16	1	2 48.3 +22.1	73.5	17				
17	2 29.4 +15.4	73.1	2 46.8 +16.4	73.1	3 04.2 +17.4	73.2	3 21.6 +18.3	73.2	3 38.9 +19.3	73.3	3 56.1 +20.3	73.3	4 13.3 +21.2	73.4	4 30.4 +22.1	73.5	17	1	2 52.5 +22.0	72.5	18				
18	2 44.8 +15.4	72.1	3 03.2 +16.4	72.1	3 21.6 +17.3	72.2	3 39.9 +18.3	72.3	3 58.2 +19.2	72.3	4 16.4 +20.1	72.4	4 34.5 +21.1	72.5	5 14.5 +22.0	71.6	19	1	2 45.5 +22.0	71.6	19				
19	3 00.2 +15.3	71.1	3 19.6 +16.3	71.2	3 38.9 +17.2	71.2	3 58.2 +18.2	71.3	4 17.4 +19.1	71.4	4 36.5 +20.1	71.4	5 15.6 +21.0	71.5	5 14.5 +22.0	71.6	19	1	2 42.1 +21.5	71.6	20				
20	3 15.5 +15.3	70.2	3 35.9 +16.2	70.2	3 56.1 +17.2	70.3	4 16.4 +18.1	70.3	4 36.5 +19.1	70.4	4 56.6 +20.0	70.5	5 16.6 +20.9	70.6	5 36.5 +21.8	70.7	20	1	2 42.1 +21.5	70.7	21				
21	3 30.8 +15.2	69.2	3 52.1 +16.2	69.3	4 13.3 +17.1	69.3	4 34.5 +18.0	69.4	4 55.6 +18.9	69.5	5 16.6 +19.9	69.6	5 37.5 +20.8	69.6	5 58.3 +21.8	69.7	21	1	2 40.1 +21.8	69.7	22				
22	3 46.0 +15.2	68.2	4 08.3 +16.0	68.3	4 30.4 +17.0	68.4	4 52.5 +18.0	68.4	5 14.5 +18.9	68.5	5 36.5 +19.8	68.6	5 58.3 +20.7	68.7	6 20.1 +21.6	68.8	22	1	2 39.0 +21.4	68.8	23				
23	4 01.2 +15.1	67.3	4 24.3 +16.1	67.3	4 47.4 +17.0	67.4	5 10.5 +17.8	67.5	5 33.4 +18.8	67.6	5 56.3 +19.7	67.7	6 19.0 +20.7	67.8	6 41.7 +21.5	67.9	23	1	2 39.0 +21.4	67.9	24				
24	4 16.3 +15.0	66.3	4 40.4 +15.9	66.4	5 04.4 +16.9	66.4	5 28.3 +17.8	66.5	5 52.2 +18.7	66.6	6 16.0 +19.6	66.7	6 39.7 +20.5	66.8	7 03.2 +21.5	66.9	24	1	2 42.1 +21.5	66.9	25				
25	4 31.3 +14.9	65.3	4 56.3 +15.9	65.4	5 21.3 +16.7	65.5	5 46.1 +17.7	65.6	6 10.9 +18.6	65.7	6 35.6 +19.5	65.8	7 00.2 +20.4	65.9	7 24.7 +21.3	66.0	25	1	2 42.1 +21.3	66.0	26				
26	4 46.2 +14.9	64.3	5 12.2 +15.7	64.4	5 38.0 +16.7	64.5	6 03.8 +17.6	64.6	6 29.5 +18.5	64.7	6 55.1 +19.4	64.8	7 20.6 +20.3	64.9	7 46.0 +21.2	65.0	26	1	2 40.1 +21.2	65.0	27				
27	5 01.1 +14.7	63.4	5 27.9 +15.7	63.4	5 54.7 +16.6	63.5	6 21.4 +17.5	63.6	6 48.0 +18.4	63.7	7 14.5 +19.3	63.8	7 40.9 +20.2	64.0	8 07.2 +21.0	64.1	27	1	2 39.0 +21.0	64.1	28				
28	5 15.8 +14.7	62.4	5 43.6 +15.6	62.5	6 11.3 +16.5	62.6	6 38.9 +17.3	62.7	7 06.4 +18.2	62.8	7 33.8 +19.1	62.9	8 01.1 +20.0	63.0	8 28.2 +20.9	63.1	28	1	2 39.0 +20.9	63.1	29				
29	5 30.5 +14.6	61.4	5 59.2 +15.4	61.5	6 27.8 +16.3	61.6	6 56.2 +17.3	61.7	7 24.6 +18.2	61.8	7 52.9 +19.0	61.9	8 21.1 +19.9	62.1	8 49.1 +20.8	62.2	29	1	2 39.0 +20.8	62.2	30				
30	5 45.1 +14.5	60.4	6 14.6 +15.4	60.5	6 44.1 +16.3	60.6	7 13.5 +17.1	60.7	7 42.8 +18.0	60.9	8 11.9 +18.9	61.0	8 41.0 +19.7	61.1	9 09.9 +20.6	61.2	30	1	2 39.0 +20.5	60.3	31				
31	5 59.6 +14.4	59.5	6 30.0 +15.3	59.6	7 00.4 +16.1	59.7	7 30.6 +17.0	59.8	8 00.8 +17.8	59.9	8 30.8 +18.8	60.0	9 00.7 +19.6	60.2	9 30.5 +20.5	60.3	31	1	2 39.0 +20.5	60.3	32				
32	6 14.0 +14.2	58.5	6 45.3 +15.1	58.6	7 16.5 +16.0	58.7	7 47.6 +16.9	58.8	8 18.6 +17.8	58.9	8 49.6 +18.5	59.1	9 20.3 +19.5	59.2	9 51.0 +20.3	59.3	32	1	2 39.0 +20.3	59.3	33				
33	6 28.2 +14.2	57.5	7 00.4 +15.0	57.6	7 32.5 +15.9	57.7	8 04.5 +16.7	57.8	8 36.4 +17.6	58.0	9 08.1 +18.5	58.1	9 39.8 +19.3	58.2	10 11.3 +20.2	58.4	33	1	2 39.0 +19.3	58.4	34				
34	6 42.4 +14.0	56.5	7 15.4 +14.9	56.6	7 48.4 +15.7	56.7	8 21.2 +16.6	56.8	8 54.0 +17.4	57.0	9 26.6 +18.3	57.1	9 59.1 +19.1	57.3	10 31.5 +19.9	57.4	34	1	2 39.0 +19.9	57.4	35				
35	6 56.4 +14.0	55.6	7 30.3 +14.8	55.7	8 04.1 +15.6	55.8	8 37.8 +16.5	55.9	9 11.4 +17.3	56.0	9 44.9 +18.1	56.2	10 18.2 +19.0	56.3	10 51.4 +19.8	56.5	35	1	2 39.0 +19.8	56.5	36				
36	7 10.4 +13.8	54.6	7 45.1 +14.6	54.7	8 19.7 +15.5	54.8	8 54.3 +16.2	54.9	9 28.7 +17.1	55.1	10 03.0 +17.9	55.2	10 37.2 +18.7	55.3	11 11.2 +19.6	55.5	36	1	2 39.0 +19.6	55.5	37				
37	7 24.2 +13.6	53.6	7 57.9 +14.5	53.7	8 35.2 +15.3	53.8	9 10.5 +16.2	53.9	9 45.8 +17.0	54.1	10 20.9 +17.8	54.2	10 55.												

89°, 271° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180°Zn=7
L.H.A. less than 180°Zn=360°-Z

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	
0	0 58.0 +15.5	90.3	0 57.7 +16.5	90.3	0 57.4 +17.5	90.3	0 57.1 +18.5	90.3	0 56.7 +19.6	90.3	0 56.4 +20.5	90.3	0 56.0 +21.5	90.4	0 55.6 +22.5	90.4	0	0 55.6 +22.5	90.4	0	0	0	0	0	
1	1 13.5 +15.5	89.3	1 14.2 +16.5	89.3	1 14.9 +17.5	89.3	1 15.6 +18.5	89.4	1 16.3 +19.5	89.4	1 16.9 +20.5	89.4	1 17.5 +21.5	89.4	1 18.1 +22.5	89.4	1	1 18.1 +22.5	89.4	1	0	0	0	0	0
2	1 29.0 +15.5	88.3	1 30.7 +16.5	88.4	1 32.4 +17.5	88.4	1 34.1 +18.5	88.4	1 35.8 +19.4	88.4	1 37.4 +20.5	88.5	1 39.0 +21.4	88.5	1 40.6 +22.4	88.5	2	1 40.6 +22.4	88.5	2	0	0	0	0	0
3	1 44.5 +15.4	87.4	1 47.2 +16.5	87.4	1 49.9 +17.5	87.4	1 52.6 +18.5	87.5	1 55.2 +19.5	87.5	1 57.9 +20.4	87.5	2 00.4 +21.5	87.6	2 03.0 +22.4	87.6	3	2 03.0 +22.4	87.6	3	0	0	0	0	0
4	1 59.9 +15.4	86.4	2 03.7 +16.4	86.4	2 07.4 +17.4	86.5	2 11.1 +18.4	86.5	2 14.7 +19.4	86.5	2 18.3 +20.4	86.6	2 21.9 +21.3	86.6	2 25.4 +22.3	86.7	4	2 25.4 +22.3	86.7	4	0	0	0	0	0
5	2 15.3 +15.4	85.4	2 20.1 +16.4	85.5	2 24.8 +17.4	85.5	2 29.5 +18.4	85.5	2 34.1 +19.4	85.6	2 38.7 +20.4	85.6	2 43.2 +21.4	85.7	2 47.7 +22.3	85.7	5	2 47.7 +22.3	85.7	5	0	0	0	0	0
6	2 30.7 +15.3	84.5	2 36.5 +16.3	84.5	2 42.2 +17.3	84.5	2 47.9 +18.3	84.6	2 53.5 +19.3	84.6	2 59.1 +20.3	84.7	3 04.6 +21.3	84.8	3 10.0 +22.3	84.8	6	3 10.0 +22.3	84.8	6	0	0	0	0	0
7	2 46.0 +15.3	83.5	2 52.8 +16.3	83.5	2 59.5 +17.3	83.6	3 06.2 +18.3	83.6	3 12.8 +19.3	83.7	3 19.4 +20.2	83.8	3 25.9 +21.2	83.8	3 32.3 +22.2	83.9	7	3 32.3 +22.2	83.9	7	0	0	0	0	0
8	3 01.3 +15.2	82.5	3 09.1 +16.2	82.6	3 16.8 +17.2	82.6	3 24.5 +18.2	82.7	3 32.1 +19.2	82.7	3 39.6 +20.2	82.8	3 47.1 +21.2	82.9	3 54.5 +22.1	82.9	8	3 54.5 +22.1	82.9	8	0	0	0	0	0
9	3 16.5 +15.2	81.6	3 25.3 +16.2	81.6	3 34.0 +17.2	81.7	3 42.7 +18.2	81.7	3 51.3 +19.1	81.8	3 59.8 +20.1	81.9	4 08.3 +21.1	81.9	4 16.6 +22.1	82.0	9	4 16.6 +22.1	82.0	9	0	0	0	0	0
10	3 31.7 +15.1	80.6	3 41.5 +16.1	80.6	3 51.2 +17.1	80.7	4 00.9 +18.1	80.8	4 10.4 +19.1	80.9	4 19.9 +20.1	80.9	4 29.4 +21.0	81.0	4 38.7 +22.0	81.1	10	4 38.7 +22.0	81.1	10	0	0	0	0	0
11	3 46.8 +15.1	79.6	3 57.6 +16.1	79.7	4 08.3 +17.1	79.8	4 19.0 +18.0	79.8	4 29.5 +19.0	79.9	4 40.0 +20.0	80.0	4 50.4 +21.0	80.1	5 00.7 +21.9	80.1	11	5 00.7 +21.9	80.1	11	0	0	0	0	0
12	4 01.9 +15.0	78.6	4 13.7 +15.9	78.7	4 25.4 +16.9	78.8	4 37.0 +17.9	78.9	4 48.5 +19.0	78.9	5 00.0 +19.9	79.0	5 11.4 +20.8	79.1	5 22.6 +21.9	79.2	12	5 22.6 +21.9	79.2	12	0	0	0	0	0
13	4 16.9 +14.9	77.7	4 29.6 +15.9	77.7	4 42.3 +16.9	77.8	4 54.9 +17.9	77.9	5 07.5 +18.8	78.0	5 19.9 +19.8	78.1	5 32.2 +20.8	78.2	5 44.5 +21.7	78.3	13	5 44.5 +21.7	78.3	13	0	0	0	0	0
14	4 31.8 +14.8	76.7	4 45.5 +15.8	76.8	4 59.2 +16.8	76.9	5 12.8 +17.8	77.0	5 26.3 +18.7	77.0	5 39.7 +19.7	77.1	5 53.0 +20.7	77.2	6 06.2 +21.7	77.3	14	6 06.2 +21.7	77.3	14	0	0	0	0	0
15	4 46.6 +14.7	75.7	5 01.3 +15.8	75.8	5 16.0 +16.7	75.9	5 30.6 +17.7	76.0	5 45.0 +18.7	76.1	5 59.4 +19.7	76.2	6 13.7 +20.6	76.3	6 27.9 +21.5	76.4	15	6 27.9 +21.5	76.4	15	0	0	0	0	0
16	5 01.3 +14.7	74.8	5 17.1 +15.6	74.8	5 32.7 +16.6	74.9	5 48.3 +17.6	75.0	6 03.7 +18.6	75.1	6 19.1 +19.5	75.2	6 34.3 +20.5	75.3	6 49.4 +21.4	75.5	16	6 49.4 +21.4	75.5	16	0	0	0	0	0
17	5 16.0 +14.6	73.8	5 32.7 +15.6	73.9	5 49.3 +16.6	74.0	6 05.9 +17.4	74.1	6 22.3 +18.4	74.2	6 38.6 +19.4	74.3	6 54.8 +20.3	74.4	7 10.8 +21.4	74.5	17	7 10.8 +21.4	74.5	17	0	0	0	0	0
18	5 30.6 +14.4	72.8	5 48.3 +15.4	72.9	6 05.9 +16.4	73.0	6 23.3 +17.4	73.1	6 40.7 +18.4	73.2	6 58.0 +19.3	73.3	7 15.1 +20.3	73.5	7 32.2 +21.2	73.6	18	7 32.2 +21.2	73.6	18	0	0	0	0	0
19	5 45.0 +14.4	71.8	6 03.7 +15.4	71.9	6 22.3 +16.3	72.0	6 40.7 +17.3	72.1	6 59.1 +18.2	72.3	7 17.3 +19.2	72.4	7 35.4 +20.1	72.5	7 53.4 +21.0	72.6	19	7 53.4 +21.0	72.6	19	0	0	0	0	0
20	5 59.4 +14.3	70.9	6 19.1 +15.2	71.0	6 38.6 +16.2	71.1	6 58.0 +17.1	71.2	7 17.3 +18.1	71.3	7 36.5 +19.0	71.4	7 55.5 +20.0	71.6	8 14.4 +21.0	71.7	20	8 14.4 +21.0	71.7	20	0	0	0	0	0
21	6 13.7 +14.2	69.9	6 34.3 +15.1	70.0	6 54.8 +16.0	70.1	7 15.1 +17.1	70.2	7 35.4 +18.0	70.3	7 55.5 +18.9	70.5	8 15.5 +19.9	70.6	8 35.4 +20.8	70.7	21	8 35.4 +20.8	70.7	21	0	0	0	0	0
22	6 27.9 +14.0	68.9	6 49.4 +15.0	69.0	7 10.8 +16.0	69.1	7 32.2 +16.9	69.2	7 53.4 +17.8	69.4	8 14.4 +18.8	69.5	8 35.4 +19.7	69.6	8 56.2 +20.6	69.8	22	8 56.2 +20.6	69.8	22	0	0	0	0	0
23	6 41.9 +14.0	67.9	7 04.4 +14.9	68.0	7 26.8 +15.8	68.2	7 49.1 +16.7	68.3	8 11.2 +17.7	68.4	8 33.2 +18.7	68.5	8 55.1 +19.6	68.7	9 16.8 +20.5	68.8	23	9 16.8 +20.5	68.8	23	0	0	0	0	0
24	6 55.9 +13.8	66.9	7 19.3 +14.7	67.1	7 42.6 +15.7	67.2	8 05.8 +16.7	67.3	8 28.9 +17.6	67.4	8 51.9 +18.4	67.6	9 14.7 +19.4	67.7	9 37.3 +20.4	67.9	24	9 37.3 +20.4	67.9	24	0	0	0	0	0
25	7 09.7 +13.7	66.0	7 34.0 +14.7	66.1	7 58.3 +15.6	66.2	8 22.5 +16.4	66.3	8 46.5 +17.4	66.5	9 10.3 +18.4	66.6	9 34.1 +19.2	66.8	9 57.7 +20.2	66.9	25	9 57.7 +20.2	66.9	25	0	0	0	0	0
26	7 23.4 +13.5	65.0	7 48.7 +14.5	65.1	8 13.9 +15.4	65.2	8 38.9 +16.4	65.4	9 03.9 +17.2	65.5	9 28.7 +18.2	65.7	9 53.3 +19.1	65.8	10 17.9 +20.0	66.0	26	10 17.9 +20.0	66.0	26	0	0	0	0	0
27	7 36.9 +13.4	64.0	8 03.2 +14.3	64.1	8 29.3 +15.3	64.3	8 55.3 +16.2	64.4	9 21.1 +17.2	64.5	9 46.9 +18.0	64.7	10 12.4 +19.0	64.8	10 37.9 +19.8	65.0	27	10 37.9 +19.8	65.0	27	0	0	0	0	0
28	7 50.3 +13.3	63.0	8 17.5 +14.2	63.1	8 44.6 +15.1	63.3	9 11.5 +16.0	63.4	9 38.3 +16.9	63.6	10 04.9 +17.8	63.7	10 31.4 +18.7	63.9	10 57.7 +19.7	64.1	28	10 57.7 +19.7	64.1	28	0	0	0	0	0
29	8 03.6 +13.2	62.0	8 31.7 +14.1	62.2	8 59.7 +14.9	62.3	9 27.5 +15.9	62.4	9 55.2 +16.5	62.6	10 22.7 +17.7	62.8	10 50.1 +18.6	62.9	11 17.4 +19.4	63.1	29	11 17.4 +19.4	63.1	29	0	0	0	0	0
30	8 16.8 +13.0	61.0	8 45.8 +13.9	61.2	9 14.6 +14.8	61.3	9 43.4 +15.7	61.5	10 12.0 +16.6	61.6	10 40.4 +17.5	61.8	11 08.7 +18.4	61.9	11 36.8 +19.3	62.1	30	11 36.8 +19.3	62.1	30	0	0	0	0	0
31	8 29.8 +12.9	60.1	8 59.7 +13.7	60.2	9 29.4 +14.7	60.3	9 59.1 +15.5	60.5	10 28.6 +16.4	60.6	10 57.9 +17.3	60.8	11 27.1 +18.2	61.0	11 56.1 +19.1	61.2	31	11 56.1 +19.1	61.2	31	0	0	0	0	0
32	8 42.7 +12.7	59.1	9 13.4 +13.6	59.2	9 44.1 +14.5	59.4	10 14.6 +15.4	59.5	10 45.0 +16.2	59.7	11 15.2 +17.1	59.8	11 45.3 +18.0	60.0	12 15.2 +18.9	60.2	32	12 15.2 +18.9	60.2	32	0	0	0	0	0
33	8 55.4 +12.5	58.1	9 27.0 +13.4	58.2	9 58.6 +14.3	58.4	10 30.0 +15.1	58.5	11 01.2 +16.1	58.7	11 32.3 +16.9	58.9	12 03.3 +17.8	59.0	12 34.1 +18.6	59.2	33	12 34.1 +18.6	59.2	33	0	0	0	0	0
34	9 07.9 +12.4	57.1	9 40.4 +13.3	57.2	10 12.9 +14.1	57.4	10 45.1 +15.0	57.5	11 17.3 +15.8	57.7	11 49.2 +16.8	57.9	12 21.1 +1												

LATITUDE CONTRARY NAME TO DECLINATION

L.H.A. 89°, 271°

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	
0	0 58.0	-15.6	90.3	0 57.7	-16.6	90.3	0 57.4	-17.6	90.3	0 57.1	-18.6	90.3	0 56.7	-19.5	90.3	0 56.4	-20.5	90.3	0 56.0	-21.5	90.4	0 55.6	-22.5	90.4	0
1	0 42.4	-15.5	91.2	0 41.1	-16.5	91.2	0 39.8	-17.5	91.2	0 38.5	-18.5	91.3	0 37.2	-19.6	91.3	0 35.9	-20.6	91.3	0 34.5	-21.5	91.3	0 33.1	-22.4	91.3	1
2	0 26.9	-15.6	92.2	0 24.6	-16.6	92.2	0 22.3	-17.6	92.2	0 20.0	-18.6	92.2	0 17.6	-19.5	92.2	0 15.3	-20.5	92.2	0 13.0	-21.5	92.2	0 10.7	-22.5	92.2	2
3	0 11.3	-15.6	93.2	0 0.8	-16.6	93.2	0 0.4	-17.6	93.2	0 0.1	-18.6	93.2	0 0.1	+19.6	86.8	0 0.5	+20.6	86.8	0 0.8	+21.6	86.8	0 1.1	+22.5	86.8	3
4	0 04.3	+15.5	85.9	0 08.6	+16.5	85.9	0 12.9	+17.5	85.9	0 17.2	+18.5	85.9	0 21.5	+19.5	85.9	0 25.8	+20.5	85.9	0 30.1	+21.5	85.9	0 34.3	+22.5	85.9	4
5	0 19.8	+15.6	84.9	0 25.1	+16.6	84.9	0 30.4	+17.6	84.9	0 35.7	+18.6	84.9	0 41.0	+19.6	84.9	0 46.3	+20.5	85.0	0 51.6	+21.5	85.0	0 56.8	+22.5	85.0	5
6	0 35.4	+15.5	83.9	0 41.7	+16.5	84.0	0 48.0	+17.5	84.0	0 54.3	+18.5	84.0	1 0.0	+19.5	84.0	1 0.6	+20.5	84.0	1 1.3	+21.5	84.0	1 1.9	+22.4	84.1	6
7	0 50.9	+15.5	83.0	0 58.2	+16.6	83.0	1 0.5	+17.6	83.0	1 12.8	+18.6	83.0	1 20.1	+19.5	83.1	1 27.3	+20.5	83.1	1 34.6	+21.4	83.1	1 41.7	+22.5	83.1	7
8	1 06.4	+15.6	82.0	1 14.8	+16.5	82.0	1 23.1	+17.5	82.1	1 31.4	+18.4	82.1	1 39.6	+19.5	82.1	1 47.8	+20.5	82.1	1 56.0	+21.4	82.2	2 04.2	+22.4	82.2	8
9	1 22.0	+15.4	81.0	1 31.3	+16.5	81.1	1 40.6	+17.5	81.1	1 49.8	+18.5	81.1	1 59.1	+19.4	81.2	2 08.3	+20.4	81.2	2 17.4	+21.4	81.2	2 26.6	+22.3	81.3	9
10	1 37.4	+15.5	80.1	1 47.8	+16.4	80.1	1 58.1	+17.4	80.1	2 08.3	+18.4	80.2	2 18.5	+19.4	80.2	2 28.7	+20.4	80.3	2 38.8	+21.4	80.3	2 48.9	+22.3	80.3	10
11	1 52.9	+15.4	79.1	2 04.2	+16.4	79.1	2 15.5	+17.4	79.2	2 26.7	+18.4	79.2	2 37.9	+19.4	79.3	2 49.1	+20.3	79.3	3 00.2	+21.3	79.4	3 11.2	+22.3	79.4	11
12	2 08.3	+15.4	78.1	2 20.6	+16.4	78.2	2 32.9	+17.4	78.2	2 45.1	+18.4	78.3	2 57.3	+19.3	78.3	3 09.4	+20.3	78.4	3 21.5	+21.2	78.4	3 33.5	+22.2	78.5	12
13	2 23.7	+15.4	77.2	2 37.0	+16.4	77.2	2 50.3	+17.3	77.3	3 03.5	+18.2	77.3	3 16.6	+19.3	77.4	3 29.7	+20.2	77.4	3 42.7	+21.2	77.5	3 55.7	+22.1	77.6	13
14	2 39.1	+15.3	76.2	2 53.4	+16.2	76.3	3 07.6	+17.2	76.3	3 21.7	+18.3	76.4	3 35.9	+19.2	76.4	4 03.9	+21.1	76.6	4 17.8	+22.1	76.6	4 26.6	+23.3	76.6	14
15	2 54.4	+15.2	75.2	3 09.6	+16.3	75.3	3 24.8	+17.2	75.4	3 40.0	+18.2	75.4	3 55.1	+19.1	75.5	4 10.1	+20.1	75.5	4 25.0	+21.1	75.6	4 39.9	+22.0	75.7	15
16	3 09.6	+15.2	74.3	3 25.9	+16.1	74.3	3 42.0	+17.2	74.4	3 58.2	+18.1	74.5	4 14.2	+19.1	74.5	4 30.2	+20.0	74.6	4 46.1	+20.9	74.7	5 01.9	+21.9	74.8	16
17	3 24.8	+15.2	73.3	3 42.0	+16.2	73.4	3 59.2	+17.1	73.4	4 16.3	+18.0	73.5	4 33.3	+19.0	73.6	4 50.2	+19.9	73.7	5 07.0	+20.9	73.7	5 23.8	+21.8	73.8	17
18	3 40.0	+15.1	72.3	3 58.2	+16.0	72.4	4 16.3	+17.0	72.5	4 34.3	+18.0	72.5	4 52.3	+18.9	72.6	5 10.1	+19.9	72.7	5 27.9	+20.8	72.8	5 45.6	+21.8	72.9	18
19	3 55.1	+15.0	71.4	4 14.2	+16.0	71.4	4 33.3	+16.9	71.5	4 52.3	+17.8	71.6	5 11.2	+18.8	71.7	5 30.0	+19.8	71.8	5 48.7	+20.7	71.9	6 07.4	+21.6	72.0	19
20	4 10.1	+14.9	70.4	4 30.2	+15.9	70.5	4 50.2	+16.8	70.5	5 10.1	+17.8	70.6	5 30.0	+18.7	70.7	5 49.8	+19.6	70.8	6 09.4	+20.6	70.9	6 29.0	+21.5	71.0	20
21	4 25.0	+14.9	69.4	4 46.1	+15.8	69.5	5 07.0	+16.8	69.6	5 27.9	+17.7	69.7	5 48.7	+18.7	69.8	6 09.4	+19.6	69.9	6 30.0	+20.5	70.0	6 50.5	+21.5	70.1	21
22	4 39.9	+14.8	68.5	5 01.9	+15.7	68.5	5 23.8	+16.7	68.6	5 45.6	+17.6	68.7	6 07.4	+18.5	68.8	6 29.0	+19.5	68.9	6 50.5	+20.4	69.0	7 12.0	+21.3	69.1	22
23	4 54.7	+14.7	67.5	5 17.6	+15.6	67.6	5 40.5	+16.5	67.7	6 03.2	+17.5	67.7	6 25.9	+18.4	67.8	6 48.5	+19.3	68.0	7 10.9	+20.3	68.1	7 33.3	+21.2	68.2	23
24	5 09.4	+14.6	66.5	5 33.2	+15.6	66.6	5 57.0	+16.5	66.7	6 20.7	+17.4	66.8	6 44.3	+18.4	66.9	7 07.8	+19.3	67.0	7 31.2	+20.2	67.1	7 54.5	+21.0	67.2	24
25	5 24.0	+14.5	65.5	5 48.8	+15.4	65.6	6 13.5	+16.4	65.7	6 38.1	+17.3	65.8	7 02.7	+18.2	65.9	7 27.1	+19.1	66.0	7 51.4	+20.0	66.2	8 15.5	+21.0	66.3	25
26	5 38.5	+14.4	64.6	6 04.2	+15.4	64.7	6 29.9	+16.2	64.8	6 55.4	+17.2	64.9	7 20.9	+18.0	65.0	7 46.2	+19.0	65.1	8 11.4	+19.9	65.2	8 36.5	+20.8	65.4	26
27	5 52.9	+14.3	63.6	6 19.6	+15.2	63.7	6 46.1	+16.2	63.8	7 12.6	+17.0	63.9	7 38.9	+18.0	64.0	8 05.2	+18.8	64.1	8 31.3	+19.7	64.3	8 57.3	+20.6	64.4	27
28	6 07.2	+14.3	62.6	6 34.8	+15.1	62.7	7 02.3	+16.0	62.8	7 29.6	+16.9	62.9	7 56.9	+17.8	63.0	8 24.0	+18.7	63.2	8 51.0	+19.6	63.3	9 17.9	+20.5	63.5	28
29	6 21.5	+14.1	61.6	6 49.9	+15.0	61.7	7 18.3	+15.9	61.8	7 46.5	+16.8	62.0	8 14.7	+17.7	62.1	8 42.7	+18.6	62.2	9 10.6	+19.5	62.4	9 38.4	+20.3	62.5	29
30	6 35.6	+14.0	60.7	7 04.9	+14.9	60.8	7 34.2	+15.7	60.9	8 03.3	+16.7	61.0	8 32.4	+17.5	61.1	9 01.3	+18.4	61.3	9 30.1	+19.3	61.4	9 58.7	+20.2	61.5	30
31	6 49.6	+13.8	59.7	7 19.8	+14.8	59.8	7 49.9	+15.7	59.9	8 20.0	+16.5	60.0	8 49.9	+17.4	60.1	9 19.7	+18.3	60.3	9 49.4	+19.1	60.4	10 18.9	+20.0	60.6	31
32	7 03.4	+13.8	58.7	7 34.6	+14.6	58.8	8 05.6	+15.5	58.9	8 36.5	+16.4	59.0	9 07.3	+17.2	59.2	9 38.0	+18.1	59.3	10 08.5	+19.0	59.5	10 38.9	+19.9	59.6	32
33	7 17.2	+13.6	57.7	7 49.2	+14.5	57.8	8 21.1	+15.3	57.9	8 52.9	+16.2	58.1	9 24.5	+17.1	58.2	9 56.1	+17.9	58.4	10 27.5	+18.8	58.5	10 58.8	+19.6	58.7	33
34	7 30.8	+13.5	56.7	8 03.7	+14.3	56.8	8 36.4	+15.2	57.0	9 09.1	+16.0	57.1	9 41.6	+16.9	57.2	10 14.0	+17.8	57.4	10 46.3	+18.6	57.5	11 18.4	+19.5	57.7	34
35	7 44.3	+13.3	55.7	8 18.0	+14.2	55.9	8 16.1	+15.1	56.0	9 25.1	+15.9	56.1	9 58.5	+16.7	56.3	10 31.8	+17.5	56.4	11 04.9	+18.4	56.6	11 37.9	+19.2	56.7	35
36	7 57.6	+13.3	54.8	8 32.2	+14.1	54.9	9 06.7	+14.9	55.0	9 41.0	+15.7	55.1	10 15.2	+16.6	55.3	10 49.3	+17.4	55.4	11 23.3	+18.2	55.6	11 57.1	+19.1	55.8	36
37	8 10.9	+13.0	53.8	8 46.3	+13.9	53.9	9 21.6	+14.7	54.0	9 56.7	+15.6	54.2	10 31.8	+16.4	54.3	11 06.7	+17.3	54.5	11 41.5	+18.1	54.6	12 16.2	+18.9	54.8	37
38	8 23.9	+12.9	52.8	9 00.2	+13.7	52.9	9 36.3	+14.5	53.0	10 12.3	+15.4	53.2	10 48.2	+16.2	53.3	11 24.0	+17.0	53.5	11 59.6	+17.8	53.7	12 35.1	+18.6	53.8	38
39	8 36.8</																								

90°, 270° L.H.A.

LATITUDE SAME NAME AS DECLINATION

N. Lat. { L.H.A. greater than 180°Zn=7
L.H.A. less than 180°Zn=360°-Z

Dec.	15°			16°			17°			18°			19°			20°			21°			22°			Dec.
	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	Hc	d	Z	
0	0 00.0	+ 15.5	90.0	0 00.0	+ 16.5	90.0	0 00.0	+ 17.5	90.0	0 00.0	+ 18.5	90.0	0 00.0	+ 19.5	90.0	0 00.0	+ 20.5	90.0	0 00.0	+ 21.5	90.0	0 00.0	+ 22.5	90.0	0
1	0 15.5	+ 15.6	89.0	0 16.5	+ 16.6	89.0	0 17.5	+ 17.6	89.0	0 18.5	+ 18.6	89.0	0 19.5	+ 19.6	89.1	0 20.5	+ 20.5	89.1	0 21.5	+ 21.5	89.1	0 22.5	+ 22.4	89.1	1
2	0 31.1	+ 15.5	88.1	0 33.1	+ 16.5	88.1	0 35.1	+ 17.5	88.1	0 37.1	+ 18.5	88.1	0 39.1	+ 19.5	88.1	0 41.0	+ 20.5	88.1	0 43.0	+ 21.5	88.1	0 44.9	+ 22.5	88.1	2
3	0 46.6	+ 15.5	87.1	0 49.6	+ 16.5	87.1	0 52.6	+ 17.5	87.1	0 55.6	+ 18.5	87.1	0 58.6	+ 19.5	87.2	1 01.5	+ 20.5	87.2	1 04.5	+ 21.4	87.2	1 07.4	+ 22.4	87.2	3
4	1 02.1	+ 15.5	86.1	1 06.1	+ 16.5	86.2	1 10.1	+ 17.5	86.2	1 14.1	+ 18.5	86.2	1 18.1	+ 19.5	86.2	1 22.0	+ 20.5	86.2	1 25.9	+ 21.5	86.3	1 29.8	+ 22.5	86.3	4
5	1 17.6	+ 15.4	85.2	1 22.6	+ 16.5	85.2	1 27.6	+ 17.5	85.2	1 32.6	+ 18.5	85.2	1 37.6	+ 19.4	85.3	1 42.5	+ 20.4	85.3	1 47.4	+ 21.4	85.3	1 52.3	+ 22.3	85.4	5
6	1 33.0	+ 15.5	84.2	1 39.1	+ 16.4	84.2	1 45.1	+ 17.4	84.3	1 51.1	+ 18.4	84.3	1 57.0	+ 19.4	84.3	2 02.9	+ 20.4	84.4	2 08.8	+ 21.4	84.4	2 14.6	+ 22.4	84.4	6
7	1 48.5	+ 15.4	83.2	1 55.5	+ 16.4	83.3	2 02.5	+ 17.4	83.3	2 09.5	+ 18.4	83.3	2 16.4	+ 19.4	83.4	2 23.3	+ 20.4	83.4	2 30.2	+ 21.3	83.5	2 37.0	+ 22.3	83.5	7
8	2 03.9	+ 15.3	82.3	2 11.9	+ 16.4	82.3	2 19.9	+ 17.4	82.3	2 27.9	+ 18.3	82.4	2 35.8	+ 19.4	82.4	2 43.7	+ 20.3	82.5	2 51.5	+ 21.3	82.5	2 59.3	+ 22.3	82.6	8
9	2 19.2	+ 15.4	81.3	2 28.3	+ 16.3	81.3	2 37.3	+ 17.3	81.4	2 46.2	+ 18.4	81.4	2 55.2	+ 19.3	81.5	3 04.0	+ 20.3	81.5	3 12.8	+ 21.3	81.6	3 21.6	+ 22.2	81.6	9
10	2 34.6	+ 15.2	80.3	2 44.6	+ 16.3	80.4	2 54.6	+ 17.3	80.4	3 04.6	+ 18.2	80.5	3 14.5	+ 19.2	80.5	3 24.3	+ 20.2	80.6	3 34.1	+ 21.2	80.7	3 43.8	+ 22.1	80.7	10
11	2 49.8	+ 15.3	79.4	3 00.9	+ 16.2	79.4	3 11.9	+ 17.2	79.5	3 22.8	+ 18.2	79.5	3 33.7	+ 19.2	79.6	3 44.5	+ 20.2	79.6	3 53.3	+ 21.1	79.7	4 05.9	+ 22.1	79.8	11
12	3 05.1	+ 15.2	78.4	3 17.1	+ 16.2	78.5	3 29.1	+ 17.2	78.5	3 41.0	+ 18.2	78.6	3 52.9	+ 19.1	78.6	4 04.7	+ 20.1	78.7	4 16.4	+ 21.0	78.8	4 28.0	+ 22.0	78.9	12
13	3 20.3	+ 15.1	77.4	3 33.3	+ 16.1	77.5	3 46.3	+ 17.1	77.5	3 59.2	+ 18.0	77.6	4 12.0	+ 19.0	77.7	4 24.8	+ 20.0	77.8	4 37.4	+ 21.0	77.8	4 50.0	+ 22.0	77.9	13
14	3 35.4	+ 15.1	76.5	3 49.4	+ 16.1	76.5	4 03.4	+ 17.0	76.6	4 17.2	+ 18.0	76.7	4 31.0	+ 19.0	76.8	4 44.8	+ 19.9	76.8	5 12.0	+ 21.8	77.0	5 12.0	+ 21.8	77.0	14
15	3 50.5	+ 15.0	75.5	4 05.5	+ 15.9	75.6	4 20.4	+ 16.9	75.6	4 35.2	+ 18.0	75.7	4 50.0	+ 18.9	75.8	5 04.7	+ 19.9	75.9	5 19.3	+ 20.8	76.0	5 33.8	+ 21.8	76.0	15
16	4 05.5	+ 14.9	74.5	4 21.4	+ 15.9	74.6	4 37.3	+ 16.9	74.7	4 53.2	+ 17.8	74.7	5 08.9	+ 18.8	74.8	5 24.6	+ 19.7	74.9	5 40.1	+ 20.8	75.0	5 55.6	+ 21.7	75.1	16
17	4 20.4	+ 14.8	73.5	4 37.3	+ 15.9	73.6	4 54.2	+ 16.8	73.7	5 11.0	+ 17.8	73.8	5 27.7	+ 18.7	73.9	5 44.3	+ 19.7	74.0	6 00.9	+ 20.6	74.1	6 17.3	+ 21.5	74.2	17
18	4 35.2	+ 14.8	72.6	4 53.2	+ 15.7	72.7	5 11.0	+ 16.7	72.7	5 28.8	+ 17.6	72.8	5 46.4	+ 18.7	72.9	6 04.0	+ 19.6	73.0	6 21.5	+ 20.5	73.1	6 38.8	+ 21.5	73.2	18
19	4 50.0	+ 14.7	71.6	5 08.9	+ 15.7	71.7	5 27.7	+ 16.6	71.8	5 46.4	+ 17.6	71.9	6 05.1	+ 18.5	72.0	6 23.6	+ 19.5	72.1	6 42.0	+ 20.4	72.2	7 00.3	+ 21.4	72.3	19
20	5 04.7	+ 14.6	70.6	5 24.6	+ 15.5	70.7	5 44.3	+ 16.6	70.8	6 04.0	+ 17.5	70.9	6 23.6	+ 18.4	71.0	6 43.1	+ 19.3	71.1	7 02.4	+ 20.3	71.2	7 21.7	+ 21.2	71.4	20
21	5 19.3	+ 14.5	69.7	5 40.1	+ 15.5	69.7	6 00.9	+ 16.4	69.8	6 21.5	+ 17.3	69.9	6 42.0	+ 18.3	70.0	7 02.4	+ 19.3	70.2	7 22.7	+ 20.2	70.3	7 42.9	+ 21.1	70.4	21
22	5 33.8	+ 14.4	68.7	5 55.6	+ 15.4	68.8	6 17.3	+ 16.3	68.9	6 38.8	+ 17.3	69.0	7 00.3	+ 18.2	69.1	7 21.7	+ 19.1	69.2	7 42.9	+ 20.1	69.3	8 04.0	+ 21.0	69.5	22
23	5 48.2	+ 14.4	67.7	6 11.0	+ 15.2	67.8	6 33.6	+ 16.2	67.9	6 56.1	+ 17.1	68.0	7 18.5	+ 18.1	68.1	7 40.8	+ 19.0	68.3	8 03.0	+ 19.9	68.4	8 25.0	+ 20.8	68.5	23
24	6 02.6	+ 14.2	66.7	6 26.2	+ 15.2	66.8	6 49.8	+ 16.1	66.9	7 13.2	+ 17.0	67.1	7 36.6	+ 17.9	67.2	7 59.8	+ 18.9	67.3	8 22.9	+ 19.8	67.4	8 45.8	+ 20.7	67.6	24
25	6 16.8	+ 14.1	65.8	6 41.4	+ 15.0	65.9	7 05.9	+ 15.9	66.0	7 30.2	+ 16.9	66.1	7 54.5	+ 17.8	66.2	8 18.7	+ 18.7	66.3	8 42.7	+ 19.6	66.5	9 06.5	+ 20.6	66.6	25
26	6 30.9	+ 14.0	64.8	6 56.4	+ 14.9	64.9	7 21.8	+ 15.9	65.0	7 47.1	+ 16.8	65.1	8 12.3	+ 17.7	65.2	8 37.4	+ 18.6	65.4	9 02.3	+ 19.5	65.5	9 27.1	+ 20.4	65.7	26
27	6 44.9	+ 13.8	63.8	7 11.3	+ 14.8	63.9	7 37.7	+ 15.7	64.0	8 03.9	+ 16.6	64.1	8 30.0	+ 17.5	64.3	8 56.0	+ 18.4	64.4	9 21.8	+ 19.3	64.6	9 47.5	+ 20.2	64.7	27
28	6 58.7	+ 13.8	62.8	7 26.1	+ 14.7	62.9	7 53.4	+ 15.5	63.0	8 20.5	+ 16.5	63.2	8 47.5	+ 17.4	63.3	9 14.4	+ 18.3	63.5	9 41.1	+ 19.2	63.6	10 07.7	+ 20.1	63.8	28
29	7 12.5	+ 13.6	61.8	7 40.8	+ 14.5	61.9	8 08.9	+ 15.5	62.1	8 37.0	+ 16.3	62.2	9 04.9	+ 17.2	62.3	9 32.7	+ 18.1	62.5	10 00.3	+ 19.0	62.6	10 27.8	+ 19.9	62.8	29
30	7 26.1	+ 13.5	60.9	7 55.3	+ 14.4	61.0	8 24.4	+ 15.2	61.1	8 53.3	+ 16.2	61.2	9 22.1	+ 17.1	61.4	9 50.8	+ 17.9	61.5	10 19.3	+ 18.9	61.7	10 47.7	+ 19.8	61.8	30
31	7 39.6	+ 13.4	59.9	8 09.7	+ 14.2	60.0	8 39.6	+ 15.2	60.1	9 09.5	+ 16.0	60.3	9 39.2	+ 16.9	60.4	10 08.7	+ 17.8	60.5	10 38.2	+ 18.6	60.7	11 07.5	+ 19.5	60.9	31
32	7 53.0	+ 13.2	58.9	8 23.9	+ 14.1	59.0	8 54.8	+ 15.0	59.1	9 25.5	+ 15.8	59.3	9 56.1	+ 16.7	59.4	10 26.5	+ 17.6	59.6	11 56.8	+ 18.5	59.7	11 27.0	+ 19.3	59.9	32
33	8 06.2	+ 13.1	57.9	8 38.0	+ 14.0	58.0	9 09.8	+ 14.8	58.2	9 41.3	+ 15.7	58.3	10 12.8	+ 16.6	58.4	10 44.1	+ 17.5	58.6	11 15.3	+ 18.3	58.8	11 46.3	+ 19.2	58.9	33
34	8 19.3	+ 12.9	56.9	8 52.0	+ 13.8	57.0	9 24.6	+ 14.6	57.2	9 57.0	+ 15.6	57.3	10 29.4	+ 16.3	57.5	11 01.6	+ 17.2	57.6	11 33.6	+ 18.1	57.8	12 05.5	+ 19.0	58.0	34
35	8 32.2	+ 12.8	55.9	9 05.8	+ 13.6	56.1	9 39.2	+ 14.5	56.2	10 12.6	+ 15.3	56.3	10 45.7	+ 16.2	56.5	11 18.8	+ 17.0	56.7	11 51.7	+ 17.9	56.8	12 24.5	+ 18.7	57.0	35
36	8 45.0	+ 12.7	54.9	9 19.4	+ 13.5	55.1	9 53.7	+ 14.3	55.2	10 27.9	+ 15.2	55.4	11 01.9	+ 16.0	55.5	11 35.8	+ 16.9	55.7	12 09.6	+ 17.7	55.9	12 43.2	+ 18.5	56.0	36
37	8 57.7	+ 12.4	53.9	9 32.9	+ 13.3	54.1	10 08.0	+ 14.2	54.2	10 43.1	+ 14.9	54.4	11 17												

LATITUDE *CONTRARY NAME TO DECLINATION

L.H.A. 90°, 270°

Dec. °	15°			16°			17°			18°			19°			20°			21°			Dec. °			
	Hc °	d ,	Z °																						
0	0 00.0	+ 15.5	90.0	0 00.0	+ 16.5	90.0	0 00.0	+ 17.5	90.0	0 00.0	+ 18.5	90.0	0 00.0	+ 19.5	90.0	0 00.0	+ 20.5	90.0	0 00.0	+ 21.5	90.0	0 00.0	+ 22.5	90.0	0
1	0 15.5	+ 15.6	89.0	0 16.5	+ 16.6	89.0	0 17.5	+ 17.6	89.0	0 18.5	+ 18.6	89.0	0 19.5	+ 19.6	89.1	0 20.5	+ 20.5	89.1	0 21.5	+ 21.5	89.1	0 22.5	+ 22.4	89.1	1
2	0 31.1	+ 15.5	88.1	0 33.1	+ 16.5	88.1	0 35.1	+ 17.5	88.1	0 37.1	+ 18.5	88.1	0 39.1	+ 19.5	88.1	0 41.0	+ 20.5	88.1	0 43.0	+ 21.5	88.1	0 44.9	+ 22.5	88.1	2
3	0 46.6	+ 15.5	87.1	0 49.6	+ 16.5	87.1	0 52.6	+ 17.5	87.1	0 55.6	+ 18.5	87.1	0 58.6	+ 19.5	87.2	1 01.5	+ 20.5	87.2	1 04.5	+ 21.4	87.2	1 07.4	+ 22.4	87.2	3
4	1 02.1	+ 15.5	86.1	1 06.1	+ 16.5	86.2	1 10.1	+ 17.5	86.2	1 14.1	+ 18.5	86.2	1 18.1	+ 19.5	86.2	1 22.0	+ 20.5	86.2	1 25.9	+ 21.5	86.3	1 29.8	+ 22.5	86.3	4
5	1 17.6	+ 15.4	85.2	1 22.6	+ 16.5	85.2	1 27.6	+ 17.5	85.2	1 32.6	+ 18.5	85.2	1 37.6	+ 19.4	85.3	1 42.5	+ 20.4	85.3	1 47.4	+ 21.4	85.3	1 52.3	+ 22.3	85.4	5
6	1 33.0	+ 15.5	84.2	1 39.1	+ 16.4	84.2	1 45.1	+ 17.4	84.3	1 51.1	+ 18.4	84.3	1 57.0	+ 19.4	84.3	2 02.9	+ 20.4	84.4	2 08.8	+ 21.4	84.4	2 14.6	+ 22.4	84.4	6
7	1 48.5	+ 15.4	83.2	1 55.5	+ 16.4	83.3	2 02.5	+ 17.4	83.3	2 09.5	+ 18.4	83.3	2 16.4	+ 19.4	83.4	2 23.3	+ 20.4	83.4	2 30.2	+ 21.3	83.5	2 37.0	+ 22.3	83.5	7
8	2 03.9	+ 15.3	82.3	2 11.9	+ 16.4	82.3	2 19.9	+ 17.4	82.3	2 27.9	+ 18.3	82.4	2 35.8	+ 19.4	82.4	2 43.7	+ 20.3	82.5	2 51.5	+ 21.3	82.5	2 59.3	+ 22.3	82.6	8
9	2 19.2	+ 15.4	81.3	2 28.3	+ 16.3	81.3	2 37.3	+ 17.3	81.4	2 46.2	+ 18.4	81.4	2 55.2	+ 19.3	81.5	3 04.0	+ 20.3	81.5	3 12.8	+ 21.3	81.6	3 21.6	+ 22.2	81.6	9
10	2 34.6	+ 15.2	80.3	2 44.6	+ 16.3	80.4	2 54.6	+ 17.3	80.4	3 04.6	+ 18.2	80.5	3 14.5	+ 19.2	80.5	3 24.3	+ 20.2	80.6	3 34.1	+ 21.2	80.7	3 43.8	+ 22.1	80.7	10
11	2 49.8	+ 15.3	79.4	3 00.9	+ 16.2	79.4	3 11.9	+ 17.2	79.5	3 22.8	+ 18.2	79.5	3 33.7	+ 19.2	79.6	3 44.5	+ 20.2	79.6	3 55.3	+ 21.1	79.7	4 05.9	+ 22.1	79.8	11
12	3 05.1	+ 15.2	78.4	3 17.1	+ 16.2	78.5	3 29.1	+ 17.2	78.5	3 41.0	+ 18.2	78.6	3 52.9	+ 19.1	78.6	4 04.7	+ 20.1	78.7	4 16.4	+ 21.0	78.8	4 28.0	+ 22.0	78.9	12
13	3 20.3	+ 15.1	77.4	3 33.3	+ 16.1	77.5	3 46.3	+ 17.1	77.5	3 59.2	+ 18.0	77.6	4 12.0	+ 19.0	77.7	4 24.8	+ 20.0	77.8	4 37.4	+ 21.0	77.8	4 50.0	+ 22.0	77.9	13
14	3 35.4	+ 15.1	76.5	3 49.4	+ 16.1	76.5	4 03.4	+ 17.0	76.6	4 17.2	+ 18.0	76.7	4 31.0	+ 19.0	76.7	4 44.8	+ 19.9	76.8	4 58.4	+ 20.9	76.9	5 12.0	+ 21.8	77.0	14
15	3 50.5	+ 15.0	75.5	4 05.5	+ 15.9	75.6	4 20.4	+ 16.9	75.6	4 35.2	+ 18.0	75.7	4 50.0	+ 18.9	75.8	5 04.7	+ 19.9	75.9	5 19.3	+ 20.8	76.0	5 33.8	+ 21.8	76.0	15
16	4 05.5	+ 14.9	74.5	4 21.4	+ 15.9	74.6	4 37.3	+ 16.9	74.7	4 53.2	+ 17.8	74.7	5 08.9	+ 18.8	74.8	5 24.6	+ 19.7	74.9	5 40.1	+ 20.8	75.0	5 55.6	+ 21.7	75.1	16
17	4 20.4	+ 14.8	73.5	4 37.3	+ 15.9	73.6	4 54.2	+ 16.8	73.7	5 11.0	+ 17.8	73.8	5 27.7	+ 18.7	73.9	5 44.3	+ 19.7	74.0	6 00.9	+ 20.6	74.1	6 17.3	+ 21.5	74.2	17
18	4 35.2	+ 14.8	72.6	4 53.2	+ 15.7	72.7	5 11.0	+ 16.7	72.7	5 28.8	+ 17.6	72.8	5 46.4	+ 18.7	72.9	6 04.0	+ 19.6	73.0	6 21.5	+ 20.5	73.1	6 38.8	+ 21.5	73.2	18
19	4 50.0	+ 14.7	71.6	5 08.9	+ 15.7	71.7	5 27.7	+ 16.6	71.8	5 46.4	+ 17.6	71.9	6 05.1	+ 18.5	72.0	6 23.6	+ 19.5	72.1	6 42.0	+ 20.4	72.2	7 00.3	+ 21.4	72.3	19
20	5 04.7	+ 14.6	70.6	5 24.6	+ 15.5	70.7	5 44.3	+ 16.6	70.8	6 04.0	+ 17.5	70.9	6 23.6	+ 18.4	71.0	6 43.1	+ 19.3	71.1	7 02.4	+ 20.3	71.2	7 21.7	+ 21.2	71.4	20
21	5 19.3	+ 14.5	69.7	5 40.1	+ 15.5	69.7	6 00.9	+ 16.4	69.8	6 21.5	+ 17.3	69.9	6 42.0	+ 18.3	70.1	7 02.4	+ 19.3	70.2	7 22.7	+ 20.2	70.3	7 42.9	+ 21.1	70.4	21
22	5 33.8	+ 14.5	68.7	5 55.6	+ 15.4	68.8	6 17.3	+ 16.3	68.9	6 38.8	+ 17.3	69.0	7 00.3	+ 18.2	69.1	7 21.7	+ 19.1	69.2	7 42.9	+ 20.1	69.3	8 04.0	+ 21.0	69.5	22
23	5 48.3	+ 14.3	67.7	6 11.0	+ 15.2	67.8	6 33.6	+ 16.2	67.9	6 56.1	+ 17.1	68.0	7 18.5	+ 18.1	68.1	7 40.8	+ 19.0	68.3	8 03.0	+ 19.9	68.4	8 25.0	+ 20.8	68.5	23
24	6 02.6	+ 14.2	66.7	6 26.2	+ 15.2	66.8	6 49.8	+ 16.1	66.9	7 13.2	+ 17.0	67.1	7 36.6	+ 17.9	67.2	7 59.8	+ 18.9	67.3	8 22.9	+ 19.8	67.4	8 45.8	+ 20.7	67.6	24
25	6 16.8	+ 14.1	65.8	6 41.4	+ 15.0	65.9	7 05.9	+ 15.9	66.0	7 30.2	+ 16.9	66.1	7 54.5	+ 17.8	66.2	8 18.7	+ 18.7	66.3	8 42.7	+ 19.6	66.5	9 06.5	+ 20.6	66.6	25
26	6 30.9	+ 14.0	64.8	6 56.4	+ 14.9	64.9	7 21.8	+ 15.9	65.0	7 47.1	+ 16.8	65.1	8 12.3	+ 17.7	65.2	8 37.4	+ 18.6	65.4	9 02.3	+ 19.5	65.5	9 27.1	+ 20.4	65.7	26
27	6 44.9	+ 13.8	63.8	7 11.3	+ 14.8	63.9	7 37.7	+ 15.7	64.0	8 03.9	+ 16.6	64.1	8 30.0	+ 17.5	64.3	8 56.0	+ 18.4	64.4	9 21.8	+ 19.3	64.6	9 47.5	+ 20.2	64.7	27
28	6 58.7	+ 13.8	62.8	7 26.1	+ 14.7	62.9	7 53.4	+ 15.5	63.0	8 20.5	+ 16.5	63.2	8 47.5	+ 17.4	63.3	9 14.4	+ 18.3	63.5	9 41.1	+ 19.2	63.6	10 07.7	+ 20.1	63.8	28
29	7 12.5	+ 13.6	61.8	7 40.8	+ 14.5	61.9	8 08.9	+ 15.5	62.1	8 37.0	+ 16.3	62.2	9 04.9	+ 17.2	62.3	9 32.7	+ 18.1	62.5	10 00.3	+ 19.0	62.6	10 27.8	+ 19.9	62.8	29
30	7 26.1	+ 13.5	60.9	7 55.3	+ 14.4	61.0	8 24.4	+ 15.2	61.1	8 53.3	+ 16.2	61.2	9 22.1	+ 17.1	61.4	9 50.8	+ 17.9	61.5	10 19.3	+ 18.9	61.7	10 47.7	+ 19.8	61.8	30
31	7 39.6	+ 13.4	59.9	8 09.7	+ 14.2	60.0	8 39.6	+ 15.2	60.1	9 09.5	+ 16.0	60.3	9 39.2	+ 16.9	60.4	10 08.7	+ 17.8	60.5	10 38.2	+ 18.6	60.7	11 07.5	+ 19.5	60.9	31
32	7 53.0	+ 13.2	58.9	8 23.9	+ 14.1	59.0	8 54.8	+ 15.0	59.1	9 25.5	+ 15.8	59.3	9 56.1	+ 16.7	59.4	10 26.5	+ 17.6	59.6	10 56.8	+ 18.5	59.7	11 27.0	+ 19.3	59.9	32
33	8 06.2	+ 13.1	57.9	8 38.0	+ 14.0	58.0	9 09.8	+ 14.8	58.2	9 41.3	+ 15.7	58.3	10 12.8	+ 16.6	58.4	10 44.1	+ 17.5	58.6	11 15.3	+ 18.3	58.8	11 46.3	+ 19.2	58.9	33
34	8 19.3	+ 12.9	56.9	8 52.0	+ 13.8	57.0	9 24.6	+ 14.6	57.1	9 57.0	+ 15.6	57.3	10 29.4	+ 16.3	57.5	11 01.6	+ 17.2	57.6	11 33.6	+ 18.1	57.8	12 05.5	+ 19.0	58.0	34
35	8 32.2	+ 12.8	55.9	9 05.8	+ 13.6	56.1	9 39.2	+ 14.5	56.2	10 12.6	+ 15.3	56.3	10 45.7	+ 16.2	56.5	11 18.8	+ 17.0	56.7	11 51.7	+ 17.9	56.8	12 24.5	+ 18.7	57.0	35
36	8 45.0	+ 12.7	54.9	9 19.4	+ 13.5	55.1	9 53.7	+ 14.3	55.2	10 27.9	+ 15.2	55.4	11 01.9	+ 16.0	55.5	11 35.8	+ 16.9	55.7	12 09.6	+ 17.7	55.9	12 43.2	+ 18.5	56.0	36
37	8 57.7	+ 12.4	53.9	9 32.9	+ 13.3	54.1	10 08.0	+ 14.2	54.2	10 43.1	+ 14.9	54.4													